THESIS

RE/DESIGNING THE WRITING CENTER TO SUPPORT TECHNICAL LITERACY INITIATIVES

Submitted by

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ABSTRACT

RE/DESIGNING THE WRITING CENTER TO SUPPORT TECHNICAL LITERACY INITIATIVES

Technology pervades most aspects of life and a level of technical prowess is all but required to participate in modern society. The increasing emphasis on STEM initiatives and "learning to code" often focuses on functional literacies and not, as Selber (2004) noted, "...on critical literacy as teachers of writing and communication think of" (p. 74). What is at stake in a critical technical literacy? Noble (2018) said in *Algorithms of Oppression* that "design[ing] technology for people without a detailed and rigorous study of people and communities, makes for the many kinds of egregious tech designs we see" (p. 70) and that "now more than ever, we need experts in the social sciences and digital humanities to engage in dialogue" (p. 13)—a technical dialogue, about how technologies are developed. Writing studies and writing center studies could find it beneficial to embrace new definitions of composing and technology rather than wait for them to make inroads to these fields. This study first recognizes how writing has grown beyond the conventional. Digital composing covers a broad spectrum from writing blog posts, designing websites, using photoshop, creating podcasts, and writing code. Vee (2017) argued in Coding Literacy that "[w]riting and programming are creative acts yet we've tried to label programming as engineering"(p. 123), and this study tries to understand what labeling programming as a form of writing alongside other digital composing ultimately means for places where writing takes place. This study focuses on writing centers, and seeks to extend Pemberton's (2003) four suggestions for "Planning for Hypertext in the Writing Center...Or Not" which suggested that writing centers can treat hypertexts (digital composing) like any other text, assume hypertext will not come into the writing center, use specialized tutors, or provide tutor training in order to serve students who enter the writing center looking to get assistance on these types of composing assignments.

In order to do this, this study collected data from participatory design focus group sessions as well as from writing center (and similar space) websites. The data was coded into five different codes: Access / Technology, Discovery / Outreach, Career Readiness, Training, and Curriculum / Coursework. Comments in these categories were analyzed to identify how individual actors—students, writing centers, institutions—function to help or hinder students who engage with the writing center with digital composing.

This study suggests that unless users believe they could be successful in engaging with the writing center with digital composing, it is unlikely that any of Pemberton's (2003) four suggestions will ever be relevant. While a successful engagement with digital composing could result from the use of typical writing center pedagogies, this needs to be clear to prospective users who may believe they require consultants and spaces with high levels of technical ability to help in their digital composing.

This study suggests that peripheral texts—texts that suggest how a user can interact with a space—are one key area where the writing center could exercise its own agency and help users understand both that they can, and how they can engage with the writing center with digital composition and technology. Curricular and institutional changes may also aid in the re-centering of the writing center to better support technical literacy initiatives throughout the university.

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The two random hikers on Mt. Sanitas who told me to stick with it.

DEDICATION

To my Dad.

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1. Introduction

As a technologist and a software programmer, I have often found it necessary to defend the value of writing studies in the field of computer programming. My rationale is simple: I've always viewed programming as simply a different form of writing—using a particular set of rhetorics to achieve a composing goal. Further, I have always felt that technology solely for technology's sake is less important than the ability to talk about how technology functions within networks of other technologies, users, and society and the ability to critically consider what is gained or lost through the application of a technology. This is to say that when embarking on a new programming project, a focus on which programming language to use—Python or C++, for example—should be secondary to a consideration of what the goal of deploying the technology is. Successful programming shares many elements of successful writing; a deep and critical understanding of the audience, the self, and the tool.

Vee's (2017) *Coding Literacy* provides vernacular to talk about computer science education and writing studies and asked "[w]hat does it mean to call computer programming a literacy?" (p. 1). With learn-to-code initiatives seemingly everywhere, (e.g., Hour of Code, Galvanize, Girl Develop It, and Black Girls Code) calling computer programming a literacy means elevating the ability to program from a nice-to-have to a necessary skill like reading and writing. The increasing emphasis on STEM reinforces the idea of computer programming as a literacy and the United States Department of Education (n.d.) said:

> "In an ever-changing world...it's more important than ever that our nation's youth are prepared to bring knowledge and skills to solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions. These are the kinds of skills that students develop in science, technology, engineering and math—disciplines collectively known as STEM. If we want a nation where our future leaders, neighbors, and workers have the ability to understand and solve some of the complex challenges of today and tomorrow, and to meet the demands of the dynamic and evolving workforce, building students' skills, content knowledge, and fluency in STEM fields is essential" (*para. 1*)

President Obama , in supporting a computer science for all curriculum said that students should "not just be able to work with computers" but instead "[develop] the analytical and coding skills to power our economy" (Obama, 2016, as cited in "Fact Sheet", para. 1). Yet, in both of these, any mention of the arts seems to be absent, which may point toward an opportunity.

   How can those of us in the fields of writing studies and writing center studies build on this opportunity and offer some of our knowledge in this national shift toward computer science education? Selber (2004) noted, that "[h]istorically speaking, courses in computer literacy have not concentrated on critical literacy as teachers of writing and communication think of" (p. 74) which suggests that writing studies and writing pedagogy could make a computer science curricula more equitable. While the question "should a computer science curriculum be included in all education?" has given way to a unanimous answer of "yes", more questions follow. Questions such as "where" and "when"(see oreno-León et al. (2016)) give way to "how" and "who". Where writing studies and English departments may certainly have a role to play here. Barrios (2005) noted that "technology is one critical mechanism" to possibly place "writing programs [and] English departments at the center of a new university" (p. 89) yet digital literacies should not and cannot take on all work of a technical literacy education. Robust collaborations across all of the disciplines where computing is encountered is needed. This study focuses on writing studies and writing center studies and seeks to understand how writing pedagogy, enacted through the writing center, can contribute to the growing conversation of a technology-centered education.

         While working in Colorado State University's Writing Center, I had a conversation with an assistant director of the center, who at the time, was teaching a course in digital composition. This course asked students to compose with blog posts, websites, audio, and video, and encouraged the use of software and programming to complete these assignments. I asked the assistant director "when your students have issues in class, where do you tell them to go?" They replied, "I tell them to visit you in the writing center!" We both laughed. My background in

technology likely made me more suited to help clients in areas of digital composing, but what happens if a client comes into the writing center to work on a digital composing assignment that involves the use of a specific technology that their consultant is unfamiliar with? How might the hierarchy of rhetorical concerns and writing center pedagogy help the client to better understand technology in this consultation? While a full and complete grasp of technology by the consultant would certainly be beneficial, it is also impractical for one person in—writing studies, but certainly those in other disciplines too—to fully understand the entire implications that composing with many digital technologies may require. Of these numerous skills—an understanding in how digital tracking and advertising works, how electronics are manufactured, business models of technology companies, machine learning, artificial intelligence, algorithms, user experience (UX) / user interface (UI) design, and software engineering—some are centered in disciplines outside of writing studies yet are still crucial in digital composing. What might writing studies be uniquely able to do in order to contribute to student learning and use of these digital literacies both broadly as well as in non-instructional settings such as the writing center?

The writing center is a unique place, and I sought to examine how it might aid in the acquisition of student's critical and rhetorical technical literacies. Harris (1995) recognized that "[h]elping students get the 'feel' of some aspects of writing is part of what a tutor can do as she sits next to the student, talking modeling, and offering suggestions, even though writing is a more sophisticated activity than any of these" (p. 33) and using technology is often a more sophisticated activity in similar ways. This led to the research question: how can writing centers be redesigned to support technical literacy initiatives?

In order to answer this, this research identifies differences in digital composing needs among students, staff, faculty, and administrators through focus groups and an analysis of writing center websites. There is considerable room for additional research in working with technology in writing centers as noted by Pemberton (2003) and Bancroft (2016), which Bell and

Hübler (2001) speculated could be due to the feeling that "[s]oftware tools tended to isolate writers from their mentors, their audience, and each other" (p. 58). While this study ultimately does not reach the discussion of leveraging technology in writing centers, it does find that these spaces may need to make it clearer in peripheral texts which function to educate users about the available interactions in the space, how they are equipped to support digital composing. If students are unaware that they could come into the writing center to get assistance with their digital composing, they are unlikely to seek assistance in the writing center. If students do not engage with the writing center in this way, it could appear as though there is limited demand for pedagogical assistance in digital composing. This limited demand, however, might also be derived from an assumption that students are digital natives and are therefore already fully technically literate. There exist opportunities for writing center pedagogy to both meet and grow these demands. This study discusses methods to center the writing center in technical initiatives as well as offers suggestions for marketing and outreach efforts.

2. Literature Review

Since the first computers, there has been speculation in writing studies about how computers will impact writing. For decades, there has seemed to be a yearning for technology to finally become both essential and complementary to composing. For the most part, that reality has arrived and the speculation can end. The proliferation of computers, in all forms, from phones to cloud servers, has had a profound impact: socially, culturally, and economically. From 1984 to 2015, per-household computer ownership in the United States grew from 8.2% to 86% (Ryan & Lewis, 2017, p. 3). Most of these households have internet access. Where perhaps those in writing studies and writing center studies had hoped this would mean substantial growth for the field of writing, the broader focus of society seems to be on the implication of widespread computing for STEM, and in particular, computer programming. Learning to code has taken center stage in the national discussion surrounding computing and pedagogy, but programming is writing too. In this chapter, I trace this social and technological paradigm shift and point toward tools and ways of thinking that can be useful in considering how the field of composition has supported technical literacies and it might expand its support.

In section 2.1 I discuss how computers and technology have started to push the boundaries of what "literacy" has conventionally meant. In section 2.2, I draw from User Experience Design (UX) and Human Computer Interaction (HCI), recognize what they have contributed to writing studies, and discuss what their research principles have to offer to a study like this. In section 2.3 I discuss how work done in and around writing centers has tried to address questions of composing with computers and technical literacies.

2.1 Building a Broader Definition of Writing and Literacy

Throughout this section, it is important to recognize that designating a type of knowledge as a "literacy" is merely a recognition of a social construction of its value: "[w]hen we call something a literacy, we mean that it is important and that it should be taught widely" and "the popular use of the term literacy reveals a rough consensus about the importance of a skill for everyday life. If enough people call something literacy, it becomes literacy" (Vee, 2017, p. 51). With this in mind, I discuss how reading and writing became a literacy, and look at the similarities between programming and writing that allow those of us in writing studies (and computer science) to call programming a form of writing, and discuss some contemporary definitions of literacy that are inclusive of reading and writing, programming, and other forms of composing. Lastly, I mention differing views of these technical literacies and show what it means to have a rhetorical technical literacy.

Vee noted the first value of a reading and writing literacy in religion:

> "[l]iteracy first gained its status as a moral good through its connection to religious devotion and salvation. The protestant belief in the necessity of reading the Bible for salvation drove the connection between reading and morality" (Vee, 2017, p. 52).

Through the reading and writing of scripture, it was long held, one could get closer to god. In the late 19th century, this same reading and writing literacy brought one closer to government operations—it was required for conducting business, keeping track of land records, having legal representation, and playing a part in democracy. In this same way, literacy assessments, in the form of reading and writing tests have served as ways to deliberately discourage democratic participation in the United States. Vee pointed to President McKinley's 1897 inaugural address where he pronounced that "[i]lliteracy must be banished from the land if we shall attain that high destiny as the foremost of the enlightened nations of the world" (p. 53). But a speech-act that pronounces reading and writing as important doesn't do much. Berlin (1987) recognized that action in practice from World War 1: "[o]ne effect of World War I was to complete a development

that had been taking shape since late in the nineteenth century: English studies became the center of public education in the United States" and that, more contemporarily "[t]he acceptance of American literature in the high school and college curriculum can be traced directly to this concern for encouraging loyalty in time of war" (p. 56). Clark (1995) draws our attention to how a new type of literacy, information literacy, is now a prerequisite for this same democratic participation, where he cited the American Library Association, in 1989, who noted that "[a]ll men are created equal but voters with information resources are in a position to make more intelligent decisions than citizens who are information illiterates" (p. 5). I will now discuss how this information literacy—interacting with computers and information—is built from reading and writing.

Many have recognized the parallels between reading and writing and programming, and though it is difficult to cover them all, I briefly provide a view of programming as a translation of action to written word and discuss early programming literacy movements. I begin with the industrial revolution where Sack (2019) recognized writing as instrumental in the codification of processes and algorithms (algorithms here as any written down, repeatable, and often recursive process). The industrial revolution was successful because processes were written down and commoditized so they could be performed by anyone and not just a craftsman. Sack called this language a "machine language":

> "[c]entral to today's work are the almost performative qualities of 'machine languages', a subset of work languages employed in the design and analysis of machines. To adequately describe how a machine works is tantamount to demonstrating the work to be done in exacting detail. When a machine is designed to replace a human in a work process, when work is automated, the actions performed by the human must be translated into a machine language" (Sack, 2019, p. 64).

This translation from performance to writing demands a high competency in writing. Hayles (1999) took this translation idea and extended it to how computers view and treat these processes—I discuss this more in the next section of this chapter. Again, the key point is that it is possible and useful to look at writing and programming similarly. Sack pointed to Paul

Edwards who noted that "computers are language machines" (p. 1) and Vee (2017) suggested

due to "their complex and multiple intersections" that "programming and writing both deserve a

central place in our thinking about human relationships with communication technologies" (p.

96). Early pioneers of computer science recognized this parallel in ways that seem to have been

lost in the latest resurgence of interest in science and technology. Vee and Sack both pointed to

a few:

> "I personally feel that the ability to analyze and construct processes is a very important ability, one which the student has to acquire sooner or later. I believe that he does acquire it in a rather diluted way during four years of an engineering or science program. I consider it also important to a liberal arts program" (Perlis, 1962, as cited in Sack, 2019, p. 9).

Vee drew attention to George Forsythe, a math professor at Stanford who favored a

programming course for all undergraduate students in much the same way as first year

composition courses function, who hoped that students "might learn that [computers] are no

substitute for creative thought, and yet that they can do a great deal of what passes for thought

in this world" (Forsythe, as cited in Vee, 2017, p. 65). Richard Hamming, a researcher at Bell

Labs, agreed, and thought that it was important "in order that the student can better understand

the civilization in which he will emerge" (Hamming, as cited in Vee, 2017, p. 65). Some of these

classes were adopted, notably at Dartmouth College, but the concept did not gain wider

traction.

With this, I turn to more contemporary definitions of literacy. The National Council of

Teachers of English (2013) maintains a definition of what they call *21st Century Literacies*,

where they noted that

> "[b]ecause technology has increased the intensity and complexity of literate environments, the 21st century demands that a literate person possess a wide range of abilities and competencies, many literacies. These literacies are multiple, dynamic, and malleable" (para. 3)

The demand for "multiple, dynamic, and malleable" literacies is the same that the New London

Group (1996) suggested would be required for participation in the emerging digital era. Where

the NCTE (2013) said that students should "[d]evelop proficiency and fluency with the tools of technology" (para. 5), The New London Group offered more and proposed that we

> "treat any semiotic activity, including using language to produce or consume texts, as a matter of Design involving three elements: Available Designs, Designing, and The Redesigned. Together these three elements emphasize the fact that meaning-making is an active and dynamic process and not something governed by static rules" (p. 74).

The NCTE definition, staying close to the tools of technology, is the one that Eyman (2015) adopted in *Digital Rhetoric* and is the one that I use in this study. From these definitions, I now turn to what we can do with them.

Selber (2004) took the idea of literacy and placed it on a spectrum: functional, critical, and rhetorical. As a metaphor, a functional literacy is one that places computers as tools, where, for example, a user could use Microsoft Outlook to send an email or Adobe Photoshop to crop an image. A critical technical literacy views computers as cultural artifacts where students are the questioners of technology and can offer informed critique. A rhetorical literacy places users as producers with technology, ideally with a reflective praxis on how they view their association with the technology with which they are co-producing (Selber, 2004, p. 25). To Selber, "[h]istorically speaking, courses in computer literacy have not concentrated on critical literacy as teachers of writing and communication think of" (p. 74). The questions that students that technology classes should be asking then, are:

> "[w]hat is lost as well as gained? Who profits? Who is left behind and for what reasons? What is privileged in terms of literacy and learning and cultural capitalism? What political and cultural values and assumptions are embedded in hardware and software?" (p. 81)

Selber's core argument, and a key point in this study, is designers of technology classes often haven't asked these questions. Vee (2017) called out that "[o]ne of the aims of rhetorical education is to help students understand the ways arguments are constructed" and asked:

> "[i]f a similar goal were broadly taken up with coding literacy, could it do the same for our understanding of algorithms? If everyone really did learn to program, would this help to shift the balance of power to control ideas and information more toward users, *all* users?" (p. 38)

With the bounds of literacy moving beyond the conventional, and into multiliteracies, it is becoming widely acknowledged that programming constitutes a literacy. This shows an opportunity for the field of writing studies to continue to apply rhetorical pedagogies to help students understand, critically, the rhetorical affordances of technology. Noble (2018) builds on Vee's suggestion and raised the stakes, suggesting the potential for this kind of literacy work being done:

> "[w]e need people designing technologies for society to have training and an education on the histories of marginalized people, at a minimum, and we need them working alongside people with rigorous training and preparation from the social science and humanities" (p. 70).

And that:

> "...now more than ever, we need experts in the social sciences and digital humanities to engage in dialogue with activists and organizers, engineers, designers, information technologists, and public-policy makers before blunt artificial-intelligence decision making trumps nuanced human decision making" (p. 13).

Organizations like Galvanize, Hour of Code, and Black Girls Code have been founded with the goal of addressing this need, but there is still work to do, and still tremendous value that traditional composition programs could offer through a focus on critical literacies. Before diving into composition pedagogy and technology, I will discuss what the related fields of UX and HCI can offer to this study.

2.2 Making Sense of Technology and Writing with HCI and UX

Together, HCI and UX offer tools that are useful to understand how persons interact with technology as well as provide the core research methods for this study. In this section, I focus on three main themes. First, I show how HCI views writing studies through a few examples. I then discuss practical implications of writing with and for computers. Finally, I discuss the concepts of usability and co-production and their relevance to digital composing.

Bussel and Taylor (2006) recognized that software projects are rarely successful on a technical basis alone. To anyone who has ever written software that is intended to be used by a person, this comes as no surprise. They referenced the same sort of translation that Vee (2017) and Sack (2019) highlighted as being crucial to software success: "...conventional software development projects measure their success by whether they have accurately translated a non-executable system description into an executable one" (p. 23) and noted that "[w]e think and speak only what can be expressed in language" (p. 25). There is a gap between the literal machine code that gets interpreted and executed by the computer and the prose—or product description—that merely describes the code "[t]he description is not executable...Developing the system means writing an executable machine that solves the business problem" (Bussel & Taylor, 2006, p. 23). Just as with writing, software and programming is judged by its success to its rhetorical audience, whether that be an end user interacting with the software or a computer running the program. Similarly Fell et al. (1996) asked their computer science students to perform the work of translation and to try to codify board game rules into an understandable conventional text before it gets turned into a program (p. 205). Fell et al. realized that "[t]he need for communication skills is not limited to the field of computer sciences, as can be seen from the recent emphasis on 'writing across the curriculum'" (p. 204). The realization that writing is not limited to compositionists (or "the writing people") is a positive here and allows for the possibility of deeper and more interdisciplinary engagements.

The computer, a tool in both programming and conventional writing, represents an opportunity for "critical engagement" as defined in *Teaching Digital Rhetoric* (2006)*,* by merging two concepts:

> "the development of an understanding of rhetorical complexities inherent in the use of digital technologies, and an understanding in how digital technologies can change both the ways users approach tasks and the ways they see the world" (p. 247)

Critical engagement allows us to look at a broader range of outcomes and interactions, as mediated through technology. Porter (2009) asked us to consider that "rhetorically, the writer

needs to be able to consider what kinds of designs will enable and encourage the kinds of

audience interactions desired" (p. 217). In this, a broader definition of audience can be engaged

in more and different ways. This leads us to a practical example of how audience, in the digital

realm, can be an opportunity for critical engagement.

Gallagher (2017) identified difficulties arising from new digital audiences, and moreover

identified a key challenge for pedagogy in a digital society: writing to other-than-human

audiences in the forms of computers. Gallagher noted:

> "[i]f we are to teach students to write and produce content for the Web effectively, then
> we may consider algorithms as an audience while understanding that this audience can
> change depending on a host of factors, including nonhuman factors(e.g. changes in
> code, algorithmic variables, changes in interfaces, and software advances) and human
> factors (e.g., who writes the code and algorithms, designs interfaces, and decides on
> software updates and when to implement these updates)" (p. 26).

Writing to an audience becomes more difficult when that audience is technology which itself

requires an understanding of certain technologies in order to successfully appeal to it. Gallagher

offered the idea of an "algorithmic audience" which is "valuable for web-writing because it pairs

human and nonhuman factors while retaining a pedagogical connection to writing and rhetoric"

(p. 27). Practically, this means that:

> "[s]tudents can 'consider their audience' in two ways. On the one hand, students may
> consider the various people interested in their protest videos, e.g., other students,
> faculty, community members and the media. On the other hand, they can focus on ways
> to increase the circulation of their videos by thinking through how users find their videos.
> That is, they can think of their audience as the processes and procedures by which
> YouTube prioritizes their videos" (p. 27).

The first is a conventional treatment of an audience but the second could be required as well in

order to meet the rhetorical goals of composition. Alterations to the discipline of writing are not

limited solely to audience—delivery changes too. Talking about Napster, a shared and

distributed digital file delivery system, DeVoss and Porter (2006) said that it "represents a

paradigm shift" and that "[w]riting is no longer just alphabetic text" (p. 179). Taken together,

these assertions suggest that there is likely still value, from a composition pedagogy

perspective, in being able to follow the hierarchy of rhetorical concerns, and in working toward

making a work of digital composing effective to an audience.

Finally, I discuss the concepts of usability and co-production. Eyman (2015) noted that "[t]wo

of the key research traditions from professional writing that are particularly appropriate for digital

rhetoric are genre studies and usability" (p. 96) and offered that:

> "Constructing students as users allows us to see them not as subordinate to the learning
> process, but as engaged participants in the technological system that is bounded by the
> institutions, departments, and physical spaces in which learning activities take place" (p.
> 97).

This study leverages usability toward evaluating whether writing centers are usable and

compatible with digital composing. Eyman went further saying that:

> "Usability [...] provides a methodology for studying both writing practices and writing
> pedagogies—and because it takes both system and user into consideration, it provides
> appropriate methods for studying digital writing practices and digital pedagogies" (p. 97)

With respect to pedagogy, if something is usable, or more usable, then it might be easier to

develop a pedagogy around it. If a technology is unusable, then it would be unlikely (if not

impossible) that it would get used, especially so for critical engagement.

At the height of usability is co-authorship. Co-authorship is an ideal state of collaboration

between two entities, such as a computer and a human, both working together in perfect

harmony to achieve an outcome. Porter (2009) put digital composing on a spectrum from

access and accessibility, to usability, to critical engagement and co-production (p. 217). This

means that something has to be usable before it can be critically engaged with or co-produced

alongside. The computer is a unique tool in co-production because while it requires an

understanding of the computer itself, co-production with a computer yields all of the benefits of

the human and the computer. The tool itself, when used properly, has an additive effect on the

practice of composing. This is why, as Porter (2003) said, "[w]e didn't get excited about the

pencil. We didn't start a field called 'pencils and writing'" (n.p). Hayles (1999) took this

complication and combined it with the difficulty of translation that Bussel and Taylor (2006) and

Fell et al. (1996) noted and then suggested the idea of intra-computer translation: "[t]he relation between machine and compiler languages is specified by a coding arrangement, as is the relation of the computer language to the programming commands that the user manipulates" (p. 30). There are programs running inside of programs on a computer, too, that can often require a particular level of understanding.

Co-authorship between entities is one possible goal between a user and a technology, as it implies a sense of usability with technology as well as might provide opportunities for critical engagements that could lead to critical understandings. In the next section, I step back from technology and focus on critical engagements and co-authoring as both of these ideas pertain to the writing center.

2.3 Where Writing Centers Leverage and Support Technology

Literacies, technology, UX, and HCI do not exist in a vacuum—they are enacted in some place. In this section, I discuss how all three of the previous themes in this chapter interact in the writing center. I first review the history, pedagogy, and physical spaces of writing centers. I will then discuss how digital composing typically functions in writing centers and how challenges in digital composing have led some writing centers toward becoming multiliteracy centers. Finally, in this section, I talk about writing across the curriculum and computing across the curriculum as initiatives that can (and often do) place the writing center at the center of writing movements inside the university.

Writing centers are unique places in the university. With a focus on contact and connection between a student (often referred to as a client) and a consultant (occasionally referred to as a tutor), these two parties work together on a piece of writing. To the writing center and the consultant, the goal of this interaction is often to make the client a better writer

through making individual pieces of writing more rhetorically sound. Consultants exercise writing center pedagogy and focus on the hierarchy of rhetorical concerns with the client. The client consultant interaction, usually working side by side at a table, makes the pedagogical approach unique. Lerner (2005) noted that "[w]riting center pedagogy is predicated on the idea that interaction is at the heart of any act of writing" (p. 306). Harris (1995) took client/consultant interaction one step further by explicitly differentiating it from other interactions in the university:

> "[w]riting centers do not and should not repeat the classroom experience and are not there to compensate for poor teaching, over-crowded classrooms, or lack of time for overburdened instructors to confer adequately with students" (p. 27)

That is, writing centers provide time with the consultant, to the client to focus on their writing and on themselves as a writer, often in 30 minute face-to-face sessions. Writing centers and this unique pedagogy evolved from writing laboratories. The vernacular here is important: in a laboratory the topic of study is closely analyzed and dissected. In writing labs, the focus was on mechanical correctness. As a user, if you couldn't "write well" or your instructor deemed your writing unacceptable, you were sent to the writing lab, where the pedagogy would typically focus on identifying missing commas, poor grammar, and incorrect capitalization. Some elements of the pedagogy practiced in these early labs are, however, worth preserving. Summerfield (1988) looked to some of those elements that underpin modern writing center pedagogy's focus on the client:

> "...all languaging acts, are, ineluctably social. The workshop [lab] experiment forced that upon us. Taking the long view, we might say that there have been two stages in this process: (1) the first was the focus on the individual, on the individual process. (2) The second is a focus on the individual in context" (p. 5).

Expanding further on the second point, the individual focus, Summerfield continued, calling out the attributes of a writing center that let it function more like a workshop than a lab:

> "[a] genuine workshop is one that builds a community of writers, readers, listeners, talkers, thinkers, who are encouraged to understand how they write as individuals, but equally important, as members of a community. The process-approach lays on the individual student a method" (p. 6).

This community is one component of the writing center that makes clients welcome and can

lead to comfortable peer-to-peer interactions. In Colorado State University's Writing Center, and

likely in others too, a consultation is started by asking how the client is, coupled with heavy

meta-discourse about what the writing center does in order to help the client understand how

the consultation will function. The consultant wears many hats and is there for the client to "help

reduce the stress, to overcome the hurdles set up by others, and to know more about writing

than a roommate or a friend, maybe even as much as their teachers" (Harris, 1995, p.

29). Again, this is frequently starkly different than many classes, especially large ones where

these kinds of one-on-one interactions rarely if ever occur. They are designed to be

collaborative, and as a result are often loud, as Clark (1995) noted:

> "because the writing center fosters a collaborative environment and tolerates a higher
> noise level than do most libraries, both students and tutors are able to ask one another
> questions freely and help each other learn" (p. 208).

Noise can be an effect of collaboration. One could say that a loud writing center with many

using its services is an effective one. But Clark continued and realized that conversation and

collaboration is a product of peer learning and helps those in the writing center to "[keep]

abreast of the technology as it develops and changes" (p. 208). If a client doesn't know

something, and their consultant is at a loss, maybe someone else in the writing center has the

answer. This is knowledge that those who engage with the writing center bring with them, but

Carpenter (2014) realized that clients bring things other than knowledge too:

> "[s]tudents bring to the space preconceived notions about what classrooms, writing
> centers, and media labs. They question whether they have the authority to shape the
> space around their own design processes to what their ideal concept of writing space
> should look like" (p. 71).

I will focus on the technology component of this comment shortly, right now I want to focus on

the fact that those that interact with the space work to shape it and bring things into the writing

center. From this, I want to immediately focus on the broader ways that writing centers function

as spaces.

Pemberton and Kinkead (2003) discussed the physical design of a new writing center with an explicit focus on encouraging open thinking and collaboration as well as welcoming new clients and making them feel comfortable: :

> "[t]he environment that we developed for an ideal writing center is calm, non-threatening, and easily understood. The overall square footage of our center is 4813, the main area totaling 2788, and the computer lab 2,025. At the entrance of the writing center is an information center, a visual that serves as an introduction even if the center is closed", designs principled off of the questions. The designers on our team echoed this theory [of even air movement affecting occupants] by reminding us that the question always in mind of a first-time visitor to any space is 'How will I be welcomed and is this a situation where I'll find myself embarrassed?' Seeing into a space begins to obviate a sense of dread" around how first-time visitors will be welcomed into the space like 'How will I be welcomed and is this a situation where I'll find myself embarrassed" and recognize that approaching this from a design manner offers the ability to "obviate a sense of dread" (p. 171).

Carpenter (2014) added to this conversation and saw these design elements in a space as aiding in a negotiation between the writing center and the user: "[s]pace design...is always a negotiation about how students will compose in certain areas over other options or, in some cases, an agreement as to how the space is intended to perform" (p. 68). This negotiation of space can extend to technology that the space embraces, both physically and affectively. That is, design and redesign of the space "supports the idea that learning and productivity are the results of the designs (the structures) of complex arrangements of people, environments, technology, beliefs and texts" (Carpenter, 2014, p. 68) and reflects the reality that composing is changing, alongside technology. This connection between users participating in the design and function of a writing center, as well as the nuance of affective space as offered by the pedagogy and physical space as framed by the layout and available technology in the writing center are discussed more in-depth in Chapter 4. From Carpenter's acknowledgement that students' ideas shape how technology functions in writing centers, I will now turn to a more in-depth discussion of the role of technology in writing centers.

The negotiation between technology and writing centers is a tension that is likely to benefit from more research. The following examples frame this study and offer a background in the felt

difficulties that this study is born out of. McKinney and McKinney (2016) wanted to see what students were bringing into writing centers and did this by simply asking them if they had come to the writing center with a piece of multimodal composing. The results, put simply, were that students very rarely brought digital composing assignments into the writing center, and of the few that did, students rarely self-identified their work as multimodal:

> "[s]tudents not naming these texts as multimodal may indicate that they are not aware of their rhetorical choices in terms of modes, but it may also mean that they are unsure how or if the term applies outside of composition courses" (p. 63).

This point is especially notable as McKinney and McKinney pointed out that multimodal composing was part of their institution's first year composition curriculum so they speculated that "many instructors reduce[d] the goal of a rhetorical multimodal sensibility into a singular assignment (where medium and technology are often decided for them)" (p. 63). This reduction is not limited to coursework though; Balester et al. (2012) saw this occurring often in writing centers too:

> "Writing centers tend to get anxious and to make other people anxious as they explore forms of composing that don't involve writing in the narrow sense of the term. Q: Can you help me with my video? A: Can we call it a video essay? Can we call it a video argument?" (p. 2)

Thus, both instructors and writing centers are likely to find it worthwhile to more actively take part in making definitions of technical composing clear. To do this, Bancroft (2016) focused on the hiring of new consultants: "[a]s new tutors are hired for multiliteracy centers, their own digital literacy skills should be assessed, rather than assumed" (p. 52). Balester et al. similarly made it clear that consultants "must revise their identities from experts in writing to experts in rhetoric" and that "they must feel as confident advising about writing a script or editing a video as they do advising about writing papers" (p. 6). This is a crucial point as broader consultant education, with a focus on rhetorical affordances of digital composing, could be one way to help students with multimodal composing and to effectively address technical literacies in writing centers, but it isn't the only way. Building suggestions for addressing technology in writing centers,

Pemberton (2003) and Balester et al. offered some. While Balester et al. saw four paths where "a writing center can evolve its identity by pursuing four paths: (1) staff (re)education, (2) physical redesign, (3) user (re)education or rebranding, and (4) name change" (p. 3) it is important to note that rebranding can lead to even more unnecessary confusion, as, for better or worse, the writing center name does carry some level of brand recognition:

> "Most higher education folks (faculty, students, and administrators) could tell you (or guess pretty accurately) what a writing center does. It is the legibility of the writing center name, I'd argue, that helps spread this story. Yet, so far, the name is inelastic—users can't see how a writing center would be the place for feedback on poster presentations, storyboards, web portfolios, audio essays, or the like" (p. 3).

I will talk about the idea of rebranding to a multiliteracy center shortly, but for now I want to focus on what this comment suggests: that for successful technology use in writing centers, we may need to look outside the writing center itself. While I will revisit this idea in Chapter 4, I would like to discuss Pemberton's strategies. He too had four suggestions, the first of which was to treat "Hypertexts Like Any Other Text" (Pemberton, 2003, p. 16). Crucially, this leaves open the possibility for rhetorical work and encourages it. There are rhetorical aims of digital composing that a traditional hierarchy of rhetorical concerns and a consultant could use to help a client become a better (digital) writer. His second solution was a reliance on the assertion that "Hypertexts Will Rarely Appear in Writing Centers". From McKinney and McKinney's study, which occurred 13 years after the publishing of Pemberton's article, this seems to not be just an assumption but the reality. Pemberton's third strategy was to use specialized tutors for certain things, which is of the same sort of suggestion that Bancroft talked about with respect to consultant hiring. His last suggestion was to provide specialized training, which splits the difference between Bancroft's hiring practices and Pemberton's notion of using specialized tutors. Through training, all tutors can be specialized. The ultimate goal that having consultants with these different—likely technical—skills is that students can then engage in a bigger variety of ways with the space:

"[w]hen multiliteracy center tutors encounter sessions in which students are struggling to use technology, they can follow similar pedagogy that guides tutoring writing concerns. As they might point out a comma splice and explain what it is and how to fix it, then ask the student to independently identify other comma splices, tutors can explain or demonstrate saving a file to a USB drive and then ask the student to take control and go through the process of saving to a different location or as a different file name" (Bancroft, 2016, p. 49).

Having briefly engaged with the topic of multiliteracy centers, I would like to discuss the idea of multiliteracy centers as possible evolutions of writing centers. Bancroft recognized that modern composing already requires some level of multiliteracy: "any writing center is a multiliteracy center, even if not in name, because students are assisted beyond the printed page, which requires multiple types of literacy" (p. 46). Yet, as Balester et al. pointed out, some inertia often remains around nomenclature. Trimbur (2010) talked about the broader mindset shift required and noted that the multiliteracy centers signal "that writing itself has always amounted to the production of visible language and isn't just the invisible composing process we sometimes imagine it to be" (p. 89). Others notice this shift too, with Balestar et al. who offered that

"Effective multiliteracy centers will require all of the resources that writing centers already have in place: structures for recruiting and training tutors, strong connections to the curriculum, and robust theories of communicating, composing, and learning. Writing centers already have these things" (p. 8).

It is difficult to be certain whether renaming the writing center would be a uniformly beneficial change, but the notion of branding and marketing should be an important consideration in defining the purpose of the space, as well as encouraging engagement with it.

Finally, I would like to look beyond the writing center (or multiliteracy center) and examine some initiatives that these centers may occasionally be the center of. My aim here is to provide a brief history of writing across the curriculum (WAC) and computing across the curriculum (CAC) efforts (of note, at Colorado State University, WAC efforts were for a time run from the Writing Center (Palmquist et al., 1995, p. 336), however this has since changed).

Writing Across the Curriculum (WAC) was "born in the 1970s during a time of curricular and demographic change in higher education" where "[f]aced with what looked like declining

skills, faculty felt the need to do something, anything, about the state of student writing"

(McLeod and Thaiss, 2014, p. 283). The idea was to integrate writing into the various places in

the curriculum to accomplish the goals of traditional writing programs without necessarily

drawing students into the writing program itself:

> "Indeed, one might say that WAC has been aimed at transforming pedagogy at the college level, at moving away from the lecture mode of teaching(the 'delivery of information model') to a model of active student engagement with the material and with the genres of the discipline through writing, not just in English classes but in all classes across the university" (McLeod & Thaiss, 2014, p. 284).

That is, WAC often focused on the proliferation of writing pedagogies into other curricula where

writing was happening—whether a biology lab report or a mathematics paper about the history

of the number e. Instructors for these courses were the target of writing instruction and

workshops and WAC recognized the rhetorics of other fields and the demand that their students

would be able to write to the requirements of those disciplines. We could say then that WAC

offered a strategy toward teaching writing in these different genres and disciplines rather than

just assigning it and deferring the education of writing to, often the English department. This

approach also counters comments often heard in writing centers, in the vein of "you're the

writing people; I'm the scientist" which McLeod and Thaiss saw as countering

hyperspecialization more broadly at the faculty level:

> "That academics are so grounded in their own disciplinary discourse conventions is an advantage to the students, but it is also an immediate challenge, precisely because those conventions seem so natural to those fluent in them that it is difficult for them to see why students struggle as they learn them" (p. 287).

While WAC works to offer writing education closer to the disciplines, and teach writing (as

opposed to merely assigning writing) CAC and WAC have similarities mostly in name only, due

in part to WAC's continued existence and CAC, as a movement's, demise.

CAC originated in the early 1980s just as personal computers and computing at large were

beginning to make meaningful inroads to universities. CAC's discussion focuses more broadly

on the use of computers in the curriculum rather than encompassing the full outreach, training,

and discipline-specific abilities that WAC offered. A 1989 collection, *Computing Across the Curriculum*, is notable, firstly, because it is one of the very few found works that actually uses the term "computing across the curriculum", and secondly, because it focused primarily on challenges in using computers in an instructional setting, as a tool, from classrooms and faculty perspectives, up to institutional and broad IT demands. Galloway (1989) explained the original enthusiasm for computing that led to work like CAC, wherein, with computing as a focus of research, certain faculty in the "physical and social sciences [were] much more likely to use computers in their teaching" (p. 221). That is, computing was not driven from pedagogy, but from convenience. From here, there are two challenges that Galloway noted about using computers in a pedagogical sense that are strikingly relevant over thirty years later. The first is that the reward system for computer use in instruction was at odds with the time available for instruction and instructor preparation:

> "Given the present reward system, by the time faculty find or create good software, learn to use it on constantly changing hardware, and incorporate it into their courses, many are ready to resist taking additional time to rigorously evaluate its effectiveness" (p. 223).

And the second was the simple lack of resources:

> "We have also learned , as we might have guessed, that most efforts to incorporate computing into the curriculum do not suffer from a lack of imagination or creativity, but rather from a lack of adequate resources" (p. 230).

The same lack of resources lead to efforts like WAC programs having to limit their outreach or simply ceasing to exist altogether. While WAC and WAC-like programs that offer broad training for faculty offer tremendous value, they do still require constant personnel, time, and funding in order to be successful. Yet, as will be discussed in this study, the opportunity for centering these sorts of literacy efforts in similar ways is a potential area for growth and relevance for the writing center.

3: Study and Data Collection Design

In this chapter, I will focus on the design decisions made in this study that allow us to address the following research question: How can writing centers be redesigned to support technical literacy initiatives? Before turning to that task, I briefly elaborate on how my technical background informs my subject position in this study and consider reflexively how myself as an actor in this study impacts the study itself. I have several years of experience in software and systems engineering for both small and large companies; I've been a student in STEM and English programs; and, I've worked as a consultant in the writing center. In all of these roles, I've observed that teaching and interacting with technology predominantly commonly unfolds within a functional approach. Yet these roles and my experience and participation in them place limitations on myself as a researcher and hence on my perspective on issues and findings. My role as an actor in this study is certainly not complete and objective; I have my own biases and predispositions. As limitations to my experience relevant to this study, as a writing center consultant, I did not participate in professional development exercises, and my time consulting was minimal. Similarly, I have not had the opportunity to teach writing in any formal instructional setting. From my experience with software and technology I am a strong believer that effective communication and rhetorical considerations is crucial to sustainable and effective technology use and creation. I have seen that often felt that technical literacies both in industry and in education could be seen to have some parallels with what Friere (2000) described as the "banking model" of education. If a student (or employee) does not know how to use Microsoft Word or invert a linked list in C++, educators (or colleagues) simply deposit the information or the algorithm in front of them. However, this approach advances the idea that technology and the learning of technology function solely in isolation; on the contrary, in this networked age, technology enables and mediates nearly all communication—whether among humans or other-than-human actors in a network. Following scholars such as Selber, Vee, Noble, and Eyman, I

argue that scholars in writing studies and writing center pedagogy should look at technology, technology use, and technology literacy through a networked approach as well. Successfully working with technology means playing the role of an actor within a larger network of other actors. For this reason, I've turned to Science and Technology Studies (STS) to theoretically inform this study. An STS approach allows for a focus on the ways that individual actors function among the network to foster technical literacies. Within such an approach, students are both users and actors in this network. In treating them as such, Eyman (2015) noted, "[c]onstructing students as users" allows us, researchers and teachers, to see them as "engaged participants in the technological system that is bounded by the institutions, departments, and physical spaces in which learning activities take place" (p. 97). Similarly, the tension in the negotiation of these boundaries between users, institutions, departments, and spaces like writing centers suggests that the idea of usability, which Woolgar (1990) applied to hardware and software design, and which is used in this study as a tool for thinking about how texts and documentation can help users better work with technology to achieve their goals.

In many cases (though certainly not all), the best—most monetarily successful, equitable, secure—software and technologies are born from a design that exudes a deep rhetorical understanding in how they will be used by end users. I would argue that writing centers function as a designed technology too. Indeed, in some ways this study could and should be viewed as an exercise in technical and software design itself. In this study, I consider the writing center processes, operating principles, and texts that guide users into the center as a form of software and suggest where this mode of thinking may be beneficial to writing studies and writing center studies scholars.

In the following sections of this chapter, I will discuss the methods and practices utilized to collect and analyze data to better understand how the design of writing centers respond to or address the teaching and learning of technical literacies. Section 3.1 offers an overview of how data was collected from the focus groups and websites. Section 3.2 offers the coding strategy

developed by (and through) this study and provides examples of the codes applied to datum. In the last section of this chapter, 3.3, I discuss the methods of analysis used in Chapter 4.

3.1 Data Collection

In this study, I collected data from focus groups and website interactions. This section discusses the methods of collection including the timeline and script for the focus group sessions as well as how the websites were selected, coded, and evaluated.

3.1.1 Focus Groups

I opted to conduct focus groups as the collaborative and peer-to-peer nature of them is reminiscent of the writing center itself. Focus groups are a form of participatory design (Spinuzzi, 2018, p. 319), and they allow for efficient data collection from many diverse perspectives. Focus groups, when "guided by a good moderator, carefully analyzed, and appropriately contextualized" are "an excellent way to uncover what and how people think...they can reveal what people believe about themselves and their needs" (Kuniavsky et al., 2012, p.131). I followed Kuniavsky et al.'s guidance from *Observing the User Experience* for the overall process and script of the sessions and leveraged Pannafino and McNeil's (2017) *UX Methods* for activities conducted in the sessions themselves.

I intended to perform two focus group sessions with two participant groups each for four total sessions. My design intent was to have a group consisting of students and another group consisting of faculty, staff, and administrators, and to conduct design sessions with both stakeholders first, and then use the resultant design from the opposing group in the second

session as the basis for a cognitive walkthrough exercise. Recruitment emails with details for participation were sent to several different faculty and student mailing lists:

> "I'm conducting a research study to examine attitudes and ideas that instructors and students have about centers, labs, and other non-instructional spaces with respect to developing and practicing digital literacies. Examples of the kinds of literacies we are interested in learning more about include composing blog posts, designing websites, using Photoshop and similar tools, multimedia presentations, and other activities that you would consider as composing-with-a-computer" (see Appendix A for full email).

I was unable to successfully recruit a group of students and moved to only conduct two sessions with a group of faculty, staff, and administrators. While this makes the data less than ideal, it is important to realize that even with student participation, these focus groups, like all, would have limitations, "[t]hey can't replace surveys" and they "do not generalize to a larger population" and are very rarely statistically significant, but they are suited to finding "human perceptions and attitudes" (Kuniavsky et al., 2012, p. 145)—a key area of focus in this study. Kuniavsky et al. recommend four guiding principles to conduct successful focus groups. The first is to select a topic of research, and the second is to determine a set of participants—these were just mentioned. The third is to determine the scope of inquiry and how that inquiry will be conducted. I built a script from two separate user experience research methods offered by Pannafino and McNeil (2017). For the first session, I relied on the imaginative framework "I Like, I Wish, What If" which "helps encourage team members to provide feedback that is clear and expresses their point of view" (Pannafino & McNeil, 2017, p. 58). This framework simply asks participants to provide thoughts and observations on the topic of inquiry, and decide which category they fit into: whether it is something that "I like" about the current system, something that "I wish" could be changed, or a far-fetched "what if" comment that hasn't been considered. As the moderator, I led the group through this activity, building a list that placed participants' thoughts and observations about the function and design of current curricula, non-instructional spaces, and technology inside the university, into these three categories.

The second session leveraged a "Cognitive Walkthrough" which provided four guiding questions:

(1) "Will the user try and achieve the right outcome?"

(2) "Will the user notice that the correct action is available to them?"

(3) "Will the user associate the correct action with the outcome they expect to achieve?"

(4) "If the correct action is performed, will the user see that progress is being made towards their intended outcomes?" (Pannafino & McNeil, 2017, p. 22).

In considering the context of a writing center consultation, one might ask, "what is the right outcome?" The right outcome changes depending on the subject position of the user, where a user is anyone interacting with the space. For a student coming into the center the "right outcome" is likely for them to emerge feeling as though their assignment has measurably improved (guiding question 4) and will receive a better grade than it would have without interacting with the writing center. However, the right outcome for a consultant is often to help the student become a better writer, which could be at odds with the student's immediate goals. Hopefully, however, a student who comes into the writing center to get help on an assignment, and gets a better grade because of it, will return to the center, and in this way they will continually work to become a better writer with the writing center. But the right action for a student might also be learning that the space exists and is an extra-curricular and non-instructional resource available for use. Occupying yet another subject position, an instructor as a user of the writing center might refer their students to the center as another resource, however the possibility exists that such referrals may frame the writing center as a fix-it center, which, while it may be a desired outcome of the interaction to the instructor, it is not the correct outcome of an interaction to a writing center administrator. Focus groups can help to create data that is more representative of these different subject positions. The participants comprised a full spectrum of users with experience in being a student, being an instructor, or being in an administrative position.

Kuniavsky et al.'s (2012) final guiding principle is to decide on a schedule. The focus group

sessions were held on a Tuesday and Thursday of the same week for one hour. Audio was

recorded from both sessions and transcribed for ease of coding and analysis.

3.1.2 Websites

Data was collected from writing center websites to understand how these sites function

as peripheral texts and how they position the writing center and writing center users within the

network they both participate in. The website and the user are actors, with agency, and the

interaction between them needs to be understood with respect to these actor boundaries. I build

on Woolgar's (1990) idea that peripheral texts are something "intended to enable the

operation/reading of a core text" (p. 81) and treat the writing center itself as the core text that

users are understanding how to "read" (or write with) through that peripheral text. In Woolgar's

usability analysis of the Stratus computer, the researchers worked to see if the documentation

provided sufficient details to enable an end user to achieve their goals in using the computer. An

example of Woolgar's asked a user to connect the printer to the computer—the facilitators of the

study had to intervene to help the user complete the task as the documentation did not offer a

"reading" of the right outcome. The reading has to suggest the right outcome, and the

interaction has to follow through on that outcome. It is also crucial that users select the right

documentation from the available documentation, as Woolgar (1990) asked "[w]ould users be

able to select the correct item of documentation when attempting to solve a particular problem?"

(p. 81). Data collected from the websites provide ways to understand subject positions and

ways of interacting with the space and can suggest how the center fits into the broader network.

I worked from a cognitive walkthrough framework, coded notable elements of documentation

that help the user to understand how to interact with the space according to this study's coding

scheme, then considered that resulting data through the critical discourse perspective of indexicality to identify the center's position in the actor network that it believes itself to function in.

George (2008) leveraged the same cognitive walkthrough from Polson et. al (1992) that Pannafino and McNeil (2017) supplied for the focus groups and used it to evaluate library websites. Building off of the four questions, while interacting with these websites, I asked:

1. What does the site ask me to do? What subject position does it place me in while I'm visiting it?

2. Is there a clear outcome from my interaction with the website?

3. What does this space offer? How could its affordances help me achieve my composing goals?

4. How will I know I'm successful when interacting with this space?

Let me explain a bit more. A "Faculty" tab would imply a Faculty subject position, and then I would look for elements under that and code them accordingly. I also asked, relevant to (2), what outcome was implied and what indexical subject position that the website placed me in, what actions it recommended I take, and how the space helped me to discover it. Were there mentions of interacting with the space leading toward being more career ready or of helping my students learn and access new technologies? Where did this space fit in among other spaces? Textually, I looked for any phrases and comments that suggested indexicality—how the space and documentation positioned itself in the network. This will be talked about more in the next section.

The websites that I chose for analysis are Colorado State University's own Writing Center, The Ohio State University's Digital Media Project, and Michigan Technical University's Multiliteracies Center. I wanted to select a reasonably diverse group of spaces and associated websites to be able to identify differences in how each one functioned. Colorado State University's writing center was chosen as it is immediately relevant to the participants of the

focus group research. The Ohio State University's Digital Media Project was selected as it is not

a writing center and does not claim to be one (OSU does have a writing center, but it is distinct

from their Digital Media Project). It is still, however, a different place within the university where

students can interact with technology, and is a space that has its own agency in networked

interactions within the university. Michigan Technical University's Multiliteracy Center was

selected because the center has explicitly labeled itself as a multiliteracy center.

Table 1

Implied Subject Position	How To Read It
"Teachers, Students, Scholars"	This comment, seen on the main page, calls out different subject positions that can interact with this space. This makes it appear as though it is for all of these different groups to interact with -- they can continue reading.
"Faculty, Staff, Graduate Students" and "Undergraduate Students"	Under "Resources", there are mentions of these subjects and the various abilities to have access to the resources in this space -- equipment for loan. Any of these groups can come into the space and interact with the technology, though there is no explicit mention of what can be checked out.
"Instructors"	Under "Facilities", instructors can leverage any of these spaces for their classes. Spaces are listed solely with the pure resources that they offer "24 iMacs", seeming as if it is up to the instructor to make sure the technology is well-suited to a particular task.
"Instructors"	Under "Teaching", the site notes that the DMP provides things from "in-class workshops on software and hardware, to assistance in developing digital media assignments and assessment...even with issues as simple as projecting media in the classroom for your students". Instructors may read this as the opportunity to work with the DMP for training, both for themselves, but also to support their students in their composing endeavours.
"Instructors and Students"	There is a "Community" page, though it is very sparse, simply mentioning that the "DMP supports the Department of English...assisting instructors and students with using technology in the classroom and for research"

Table 1 contains the results from an interaction with Ohio State's Digital Media Project. Full tables, coded according to the scheme that I discuss in the next section, are available in Appendix F through H.

3.2: Coding Scheme

In this section, I will provide the coding scheme that was developed as a result of this study, and I will briefly explain how it functions and provide example comments. This section focuses purely on the codes and data within this study. In Chapter 5 I offer a broader heuristic that may be useful in assessing efficacy of spaces and how they engage in technical literacies.

To develop this scheme, I followed Spinuzzi's (2018) guidance for coding, which identifies three different types of codes: starter, open, and axial (p. 162), with starter codes, those crafted ahead of the research based on the literature; open, those that arise from the data; and axial, codes that seek to codify the relationality in the data. These codes were derived from my subject position and personal experiences in interacting with technology as well as from the literature mentioned in Chapter 2. Briefly, I discuss some specific works that influenced the design of this study. Bancroft (2016) discussed the set of circumstances that led to the creation of a "Computing Commons", which included a multiliteracy center, inside of her community college. Different centers with different specialties (like an IT help desk or printing services, and the writing center) worked together to help students complete technology assignments more successfully—this informed *Spaces* and *Access / Technology* and suggested how they are connected. Davis (2014) offered curricular guidance in the form of syllabi to help instructors better incorporate new technologies, which informed the *Curriculum / Coursework* code. The code *Access / Technology* was partly informed by Selber, but is also an especially prevalent theme in Pantelides' (2012) work where she discussed challenges that students had

fitting new technologies (blog posts) into their view of academic assignments. Carpenter (2014) discussed the physical spaces of new writing centers, and how the design goal was to "create spaces for shared visual and affective experience" (p. 76) which, informed *Spaces* and, as I will note in Chapter 4, ultimately led me to understanding *Spaces* in two subcategories.

Table 2

Code Category	Definition	Example
Spaces	Describing an interaction with a space or surface, physical or otherwise.	
		"I would like this space to have comfortable seating"
		"This space would be more effective if it had a smart board"
		"This space includes 4 separate consultation rooms, has a digital conference room to reserve, and is open from 8-4. Appointments recommended"
Curriculum / Coursework	Describes a difficulty with curriculum or coursework, or something that could be changed in the curriculum or coursework to improve learning outcomes.	
		"There's so much we have to cover in the class and we can't always go in-depth with the technology"
		"Where do students learn these technical skills?"
		"I don't always feel like I have the ability to help my students with new technology that I'm

		uncomfortable with myself"
		"Our center is trained to help students in assignments such as…"
Access / Technology	References using technology to complete a specific task, negotiations in accessing technology and technical knowledge.	
		"How do you even start to use this technology?"
		"I see a lot of people struggling with this [specific] technology"
		"What about students or others who can't access this technology?"
		"We can help you use [technologies]"
		"Our lab is equipped with computers with Word and Photoshop"
Training	Discusses a shortcoming or benefit in training separate from Curriculum / Classwork.	
		"What if there was a workshop for this?"
		"We aren't trained to use this software!"
		"See our calendar for workshops that we offer"
Discovery / Outreach	References how users would discover a space.	
		"I didn't know that a space like this existed, this is great!"
		"We go to classrooms and tell them about our space"

		"It would be great if there were an email list that people could subscribe to and read to learn about events and workshops that the space offers"
Career Readiness	Discusses how something can aid students in career readiness or references technologies beyond the university.	
		"This technology is being used out there in the real world and students should be exposed to it"
		"There are modes of writing in business too that students don't get exposure to"

Table 2 contains the codes that resulted from this study.

3.3 Methods of Analysis

In this section, I discuss my methods of analysis, how these methods functioned with both data sets, and what these methods yielded. My analysis sought to understand how different actors function to help users achieve their composing goals. As mentioned at the beginning of this chapter, I followed Potts' (2014) use of ANT to discern how different actors negotiate with each other as stakeholders. In recognizing that it's impossible to capture all actors, as Porter et al. (2000) noted "...there is not one, holy map that captures the relationships inherent to the understanding of the institution" (p. 623), I treat the institution, as an actor itself, alongside students and writing centers. While the coded focus group comments pointed toward some tensions arising in specific interactions, the reading of the websites helped to educate a

subject in how it could or should interact with the space. These two together describe the user-as-actor and the space-as-actor, and in identifying relationships in the interaction between these two, I seek to better understand how either could be redesigned to achieve a more successful outcome.

A discourse consideration here is indexicality, which Johnstone (2018) offered as "a linguistic form or action which...points to and sometimes helps establish the social context…[and can] point to pre-existing social meaning…[or]...create social meaning" (p. 148) and while "[p]articipation frameworks", which place personas into roles—like student, or instructor—can be useful useful, Johnstone cautions that they "can be more complex in technologically mediated discourse" (p. 154). This latter comment recognizes the difficulty in analyzing the websites based on an implied or assumed subject position as different interactions and different readings of websites can arise from an interaction being mediated by different technology. (I discuss more difficulties with this study and ways that it could be improved in Chapter 5.) However, using indexicality helps us to identify and define the boundaries that makes Potts' (2014) methods of analysis viable. Potts noted what ANT lets us do:

> "ANT enables us to robustly analyze and discuss the efforts of multiple actors to push information through a given network...Being able to trace information as it moves through these networks is key to mapping these actors and architecting for the smoother transference of information to support the use of these systems" (p. 28).

This information that I analyze in this study is in the form of documentation for how to use a center or for how (or why) to interact with technology toward some goal. How might the center negotiate the center's non-user stakeholders such as curricula or other fields and inform the user in an interaction? How might the user negotiate and inform the center in an interaction?

The product that these methods of analysis yield, within this study design, are networks with actors. With a network as such, it becomes possible to identify the negotiations that arise from one actor's interactions with another—such as a student learning about a writing center, a

student being invited into the writing center, or a student engaging with a consultant on a digital

composing assignment.

4: Analysis

  This chapter begins with an analysis of the data collected from the focus group sessions

and the websites conducted with the methods of analysis offered in Chapter 3. I will also

discuss what this analysis yields and how the data suggests how both writing studies and

writing center scholars may find it beneficial to think about digital composing and technical

literacies in their work. Finally, I will propose a heuristic that could be used to assess the

efficacy of peripheral texts in advertising a space's digital composing abilities.

4.1 Data Analysis

  In this section, I analyze the data from the focus group sessions and the center websites

focusing on specific comments and interactions. See Appendix D for the first focus group

session's comments, Appendix E for comments from the second focus group session, and

Appendix F, G, and H for Ohio State University's Digital Media Project, Colorado State

University's Writing Center, and Michigan Technical University's Multiliteracy Center,

respectively.

4.1.1 Focus Groups

  In this section, I will discuss and analyze selected comments from both of the focus

group sessions and look through the analytical lens offered in Chapter 3 to identify both

difficulties in interacting with the writing center and opportunities for improvement. I begin with

the first focus group session which was primarily generative and offered comments and

suggestions that led to themes like *Discovery / Outreach* and *Career Readiness*. I will then

discuss and analyze the results from the second focus group session, the cognitive walkthrough

exercise.

   The first comments that I would like to draw attention to are (3) and (4). Comment (3) noted

that: "It's really hard as a teacher to teach not only your content but also have to teach

somebody how to use something that might be assumed as known" whereas comment (4)

offers that "we make this assumption that all students...are digital natives." Both comments were

coded as *Training* and *Access / Technology*. We see a tension that while there may frequently

be an expectation that students know more about emerging technologies than their instructors,

making this (often false) assumption means that teaching the content (writing) then can fall

secondary to teaching students about how the platform can and might be used. Keeping these

two comments in mind, consider comment (13), coded as *Access / Technology*, "...students are

so plagued and overwhelmed by [using the technology] they're not actually telling the story!". A

goal in digital composing is often to use technology toward a unique rhetorical effect that may

not be possible with conventional composing, but with an overt focus on the technology, the

rhetorical aim of the composing can be lost. This is likely not a surprise to anyone who has

studied technology use in classrooms or has themselves struggled to compose with new

technologies. This tension of the participants' was recognized in more comments as well.

Comment (12), coded as *Access / Technology* and *Curriculum / Coursework*, recognized that in

the classroom and at the curricular level, it is often unclear why a technology is chosen for a

particular task: "...why did we choose this genre of technology to pair with this task that we're

doing in the classroom?". Composing with the pencil (and prose) as a technology is only "easy"

and "traditional" because it is something that has been taught. Removing the assumption of

knowledge of how to use a particular platform, someone must teach these platforms and

technologies (which, as I note later, brings up more questions of labor). Comments like these

may be seen as a reinforcement of Galloway's (1989) comment from 2.3 where he noted that

frequently due to the time that it takes to understand a particular technology, the question of whether that technology is suited to a particular task or not often falls secondary to the fact that the technology is a known quantity. This, however, leads to comments like (9), coded as *Curriculum / Coursework:*

> "I wish there was a deeper level of commitment to the platform...a lot of times, it seems like a blog post would be cool, let's do it, but there's not a lot of correlation to what that blog post is really doing and functioning as a literacy"

This comment recognized that a functional literacy—being able to use a particular technology effectively—is a prerequisite to understanding what the technology can offer rhetorically. These literacies and technologies take time, and in (possibly) falsely assuming that students are digital natives who only require limited training to use a technology, or who might be able to help the instructor understand the technology, may lead to both confusion and a lack of rhetorical engagement.

The next comments that I would like to highlight are those that led to the development of new codes. These codes point to possible strategies to address the teaching and learning difficulties identified in the comments just discussed. Comment (6), coded as *Training* and *Access / Technology*, suggested "training drop-in sessions for technologies" offered by the center. In this scenario, training of these technologies and platforms could be offered in the writing center (Balester et al. (2012) do just this). Yet, in this case, users who want to participate in this training would still have to know that both the writing center exists and that they provide training. For this task (i.e. training) as well as others (e.g. conventional writing center consultations), if a user does not know about it, the space may as well not offer it or even exist itself. Focus group participants highlighted their experienced difficulties of discovering services and the scarcity of awareness in both the first and second sessions when discussing how a writing center could better support technical literacies. The *Discovery / Outreach* code was developed to capture these comments and will be discussed later.

The other code that was developed to capture unexpected comments arose from the tension described in comment (16), coded as *Training* and *Curriculum / Coursework*, which focused and built upon the idea of training and suggested that "students should be exposed to these kinds of platforms [it would] really help them in the future". This comment pointed toward platforms and technologies outside of the writing center (and perhaps outside of the curriculum). This recognized that the technology that exists inside of the university, often, due to constraints such as time and knowledge, are rarely the technologies used in industry. This led to *Career Readiness* which recognized that there could be an opportunity in appealing to users' career aspirations both in training, but also in digital composing practices and genres.

I want to draw attention to and discuss two final comments from the first focus group session. Comment (15) was a wish for windows: "I wish our writing center had windows in it...think about locking yourself in a closet and trying to write" (Colorado State University's Writing Center is currently located in a windowless basement room) and (8) asked "what if there was a collaboration between the writing center and other spaces on campus?". Both of these were coded as *Spaces*, and they are notable as they are the only two comments from the first session that were coded this way. This was unexpected, but as I will discuss later in this chapter, the lack of comments coded as *Spaces* gave a deeper understanding of the different components in a space and led to recognizing infrastructural space and affective space as two parts of *Spaces*.

Moving to the second focus group session, the intent was to take the ideas generated in the first session and work, collaboratively, to understand how such an imagined space might function in specific user interactions. In this session, most notable comments that I discuss here were coded as *Discovery / Outreach*. Addressing the challenge of discovery was the primary focus of this session and the few comments that did address specific opportunities for interaction in the writing center primarily emphasized how those interactions would likely be useful toward driving use of the space.

40

At the core, tensions related to discovery in this study are most evident through comments like (17) which noted that "oftentimes, people will come in and be like 'we had no idea you existed, but now that I know you're here, I'll be here all the time". Surely those that have worked in a writing center will understand this comment. Comment (32) then suggested different and possibly more fruitful avenues, like social media, for conducting outreach and marketing:

> "students especially on campus are so overwhelmed, I mean, think about how many flyers you see everywhere, so, that's a really tricky thing. How do we, how do we set yourself apart from that? So I wonder, even if almost making, like, does the writing center have a facebook page?"

Marketing can often be a crucial component that may help prospective users to learn about the writing center and understand what it can be used for, but the next question to ask is how such marketing would talk about the space and educate users about how to interact with the space effectively. Comment (28), coded as *Access / Technology*, emphasized that the "most important thing for student recall are for them to actually know that they're doing the thing", suggesting that there should be guidance on what the thing (digital and traditional forms of composing) is and how the user is intended to interact with the space and become more successful, in their view, from that interaction. For example, when trying to decide whether to engage at all, a prospective user might ask how an interaction might help their grade. The next subsection shows how writing center websites might do this work. Further adding to the discussion of what a writing center may have to offer in a prospective interaction, comment (19) suggested the idea of project-based learning as a way to encourage, at the curricular level, a deeper understanding and a deeper engagement with specific technology platforms. Long-running project-based learning could make more time for understanding and learning about technology platforms, and, as mentioned earlier, the writing center could be at the center of these efforts. In this way, the writing center could directly complement the curriculum.

Melding *Discovery / Outreach* with *Access / Technology*, comment (26) suggested

displays of how other users have leveraged different digital composing technologies to help new

and prospective users understand and expand their expectations of composing and interactions:

> "Just like this big graphic thing that's just kind of fun and catchy and approachable...like, how do I get started on a paper or letting you know just a little of all the things that you actually do in that space…[people look] kind of timid 'cause when you come up to a place you're going to want to check it out by yourself first before like diving right in, and if there was some sort of you know summary of like what this place does and am I at the right place and kind of in a welcoming sort of way that they would know okay, that this is what I'm after and they know that I know that they can help me in here"

This comment spoke to the idea of affective space. A physical display like this functions to

educate the user, but it also may confound assumptions about what composing can look like

and make users more comfortable in engaging with new and different modes of composing.

Other comments addressed this as well. Comment (33) suggested how existing spaces, such

as learning management systems, could be modified to educate users about the writing center:

> "I think, if there's a link to, a link on canvas to the writing center, where students can just click and just go straight to the writing center...There should be a link...And then there may be some kind of snippets of videos showing the way that writing centers, consultations are done, not necessarily talking, but 1:1 that the consultant and the student will have in different positions...let some of them understand that ok, the writing center is not just another classroom where you go, it's a place where you go and meet somebody 1:1 and you feel relaxed, yeah"

This point could be seen as exceptionally important as universities are consolidating and

enhancing their digital presences. All students at most major universities must interact with the

learning management selected by the administration (at Colorado State University the LMS of

choice is Canvas, but others include Blackboard and Moodle). Offering a hyperlink that leads to

the writing center website in the LMS would serve as direct outreach, and could be particularly

effective if it were in close proximity to the section of the portal where students interact with

assignment sheets (that may ask them to compose digitally) or writing blog posts. Once they

arrive at the writing center website, there could be examples of how they would further interact

with the writing center, such as showing them videos of how consultations can be conducted in

order to make them comfortable with interacting with the space. This offers a way for *Discovery*

/ Outreach to lead to successful interactions with the space and with successful applications of

writing center pedagogy. Other comments like (23) suggested that humility might be

encouraged through the design of the affective space:

> "it's kind of a flattening of any kind of hierarchy of like you know oh we know everything and you come to us and we impart knowledge to you, it's it's really not like that at all I mean we make it so, like first of all, there's no dumb questions"

Further, comment (26), "some students, when they see something too big...they may be

intimidated to approach it" suggested other ways that spaces can be designed affectively.

As a comparison and a compliment to affective space, I offer a comment that discusses the

idea of infrastructural space. One of the key components of writing center pedagogy is

connection and empathy, and where connection and empathy make a space affective, the

space itself is made up of infrastructure. Does the space have computers? Does the space have

bookshelves? Does the space have a 3D Printer? While an infrastructural space can be the

space that physically contains these things and houses the writing center, an infrastructural

space can also be a website, as comment (31) recognized:

> "I think we need to trend in the writing center, in that way, whereby students don't have to necessarily go to YouTube to download some videos to watch how to maybe write a text or how to write a particular genre because the Writing Center will have the most credibility compared to YouTube so if we can send empower, writing centers, digitally, to control that space"

This particular comment evokes thoughts of resource storefronts like the Purdue OWL and it is

important to recognize that this may be equally useful to users as well. The second focus group

session recognized that while an affective space may be suited to writing center pedagogy,

infrastructural space can work with affective space to encourage interaction.

4.1.2: Center Websites

This section will provide an analysis of the center websites and examines how the space positions itself in relation to users. For each of the websites mentioned in Chapter 3, from interacting with the websites as a user and analyzing discourse elements, I construct a network that shows how that space sees itself functioning with other actors and users.

Beginning with the Ohio State Digital Media Project (DMP) recall that it does not market itself as a writing center. The DMP's primary co-actors seemed to be faculty and instructors. The website listed hours of operation, but lacked any means or recommendation to take action (such as making an appointment) for any group of users. A "Resources" page listed available equipment for checkout to "faculty, staff, and graduate students" as well as select undergraduates. While undergraduates could still checkout equipment (albeit under stricter conditions), the page recommended that instructors ensure their students are aware of these. This page implied a clear course of action as an instructor: checkout equipment and inform your students that for class, they may do the same. A "Teaching" page gave additional weight to a reading of the website and space as being primarily for instructors. The Teaching page noted that the DMP offered "in-class workshops on software and hardware" and "assistance in developing digital media assignments and assessment...even with simple issues as projecting media in the classroom for your students". The statement "your students" further places a reader into an instructor subject position. The DMP recommended itself as an actor that imparts technical knowledge first to instructors. Students do not seem to be intended as direct users of the DMP. This could be understood as placing the burden of ensuring students' success in working with technology on the instructor. While the DMP may be able to help instructors leverage technology for their classes, it is up to those instructors to seek that help. Empathy and connection must be provided by those instructors. Pages on the website where we might expect to see components of affective space such as the "Community" page were sparse and

suggested no additional means of interacting with the DMP. In this, the DMP appeared to

situate itself as a space with certain infrastructures available for instructors to leverage on behalf

of their students. Computers, computer labs, and technology available for checkout appear to

be available in a purely infrastructural sense. The space encouraged instructors to engage with

it for technical training and then bring their classes to the space to take advantage of the

physical infrastructure available. Technical knowledge moves from the space to the instructor

and then finally to the student.
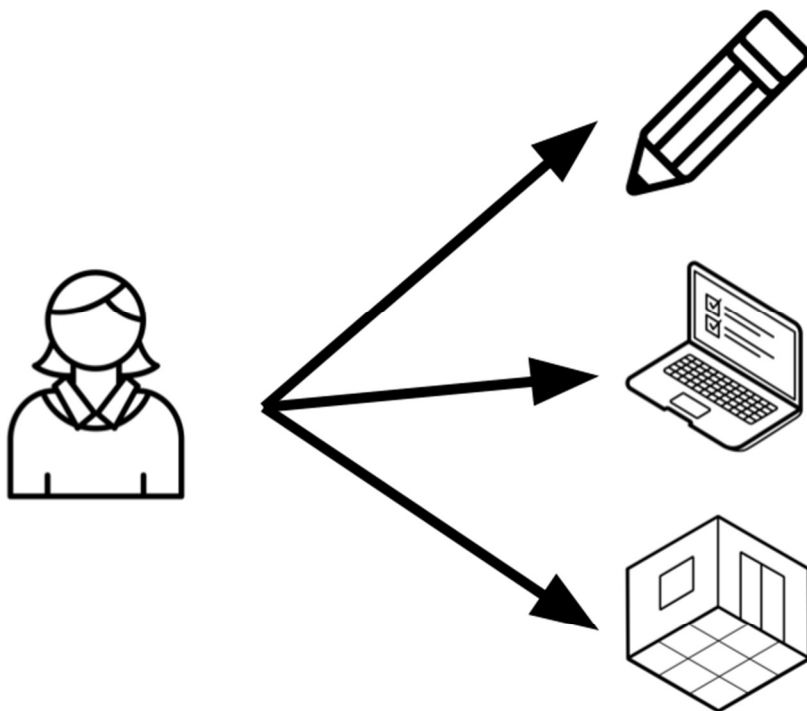
Figure 1: The Space acting on an Instructor acting on a Student.

Figure 1 shows a diagram of knowledge and interaction flow resulting from this reading and

interaction with the space. There are possibly-expected actors that are notably absent in this

interaction. There were no mentions of curricula or coursework that the space advertised as being uniquely well-suited to help instructors help their students engage with digital composing assignments or other aspects of technology. There were no mentions of other spaces that could work with the DMP to provide additional and complementary resources such as the writing center or library. As a student user, a reading of the DMP suggested few, if any, possible direct interactions. Conversely, the DMP placed the instructor as the primary actor in educating students, yet only suggested training. With so much pressure placed on the instructor to leverage the space and limited examples of how they could do so, the DMP website might be understood as a computer or a technology with limited documentation.

I now turn to Colorado State University's Writing Center, which offered a different and more student-centered perspective and yielded examples that show how a website could successfully function as a peripheral text. The text of the website more clearly identified prospective actors with the space and announces a preference. The "Make an Appointment" link is larger than the one to "Schedule a classroom presentation". The positioning of these links and the clear language make the interaction and intended outcome from this space much clearer than the DMP (which provides only office hours). The target user of the writing center suggested by these links is intended to be a student though instructors are also invited to engage with the center and request a class presentation to educate their students about the center and its capabilities. The student interaction with the writing center is clear. Successful use of the writing center requires no intermediary role such as the one the instructor must perform in the use of the DMP. The website also suggested *Career Readiness* in the form of a "we're hiring" notice, which served as both an invitation for a deep participation with the space—to interact so much with the space as to become a part of it—and to offer an opportunity for students who want the professional experience of working alongside writers. The writing center expanded the definition of user beyond just students and noted that the writing center's services are offered to "students, faculty, and staff of CSU and with members of the local community". To help these

prospective users understand what an interaction with the writing center may look like, it provided that "Face to Face Consultations...last for 30 minutes". This can demystify an interaction with the space, helping users to understand how the space will make them feel welcome. The potential for connection in a face to face setting is frequently an effective component of the writing center. Further, the "About" section welcomed different forms of composing, noting that the goal is to help writers of "all disciplines working on all types of writing from traditional research papers to electronic texts such as websites and blogs". Briefly noting elements that were unclear in this interaction, for speculative users, there was limited suggestion of how the writing center works with (or against) *Curriculum / Coursework* and it suggested a path to success for users by simply noting that "writers walk away with the confidence to make effective writing choices in any writing situation." As a peripheral text, the Colorado State University Writing Center website is likely to be more effective than the DMP's in informing prospective users about how and why to interact with the space. The audience is clear and different users are well-defined. Users are suggested means of engaging with the space (such as scheduling an appointment). The website suggests the writing center as a singular entity with which users interact.
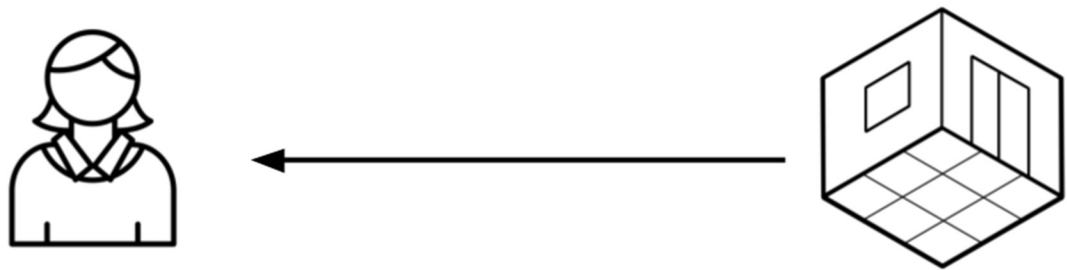
Figure 2: The Space acting on a User

A diagram of how this reading suggests users interact with this space is shown in Figure 2. This is to say that while there may be some external influences on the user, such as an instructor suggesting that they engage with the writing center, it is still the user who opts into that interaction with the writing center. In this, *Discovery* can be understood as primarily placed on the user where the user must leverage the writing center's resources to determine if an interaction with the space will result in success.

Finally, I turn to Michigan Technical University's Multiliteracy Center (MTMC) website. The MTMC website provides a worthwhile comparison to the DMP and Colorado State University Writing Center websites. The MTMC offered a very straightforward analysis for

identifying subject positions and suggested interactions that users may have toward different ends, such as *Career Readiness* or *Curriculum / Coursework*. A key component of the MTMC site came from leveraging the consistent language of "Coach" (as the tutors). This discursive decision emphasized the affective space of the center and made it clear that the interaction with the coach is the primary one in the MTMC. Users are told that they are not engaging with the space itself but rather with a Coach, who then embodies the MTMC and its pedagogy. The focus on this encapsulation of values into the Coach represents a key point. In placing all of the pedagogy, writing experience, and connection on the coach, and suggesting that mode of interaction as the only available one, this makes the intended interaction clear to users and leads to an effective and affective experience with the space through the coach. Engaging further with the site, there was text that addressed the role and value of the MTMC in various ways that accord with this study's coding scheme. Recognizing *Access / Technology* and *Curriculum / Coursework*, the website noted that "MTMC Coaches can help with anything in the realm of multiliteracies, including visual, aural, written, and spoken text forms" and further invited users to work with a coach on "upcoming papers, exams, or assignments". Clear guidance was given on what to expect in an interaction with a coach is given on a page titled "What to Expect in an MTMC Session", which described the full process from scheduling an appointment, engaging with the physical space, working with the coach, and leaving. As a peripheral text, the MTMC website offered nearly everything required for a successful interaction with the space. It provided guidance on engagement and offered examples of working toward coursework in the curriculum, and it focuses the target of interaction to a single entity, the Coach.
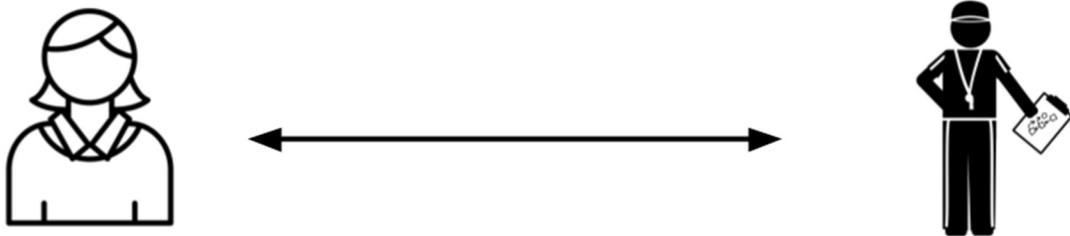
Figure 3: The Coach working with a User

With this focus on the Coach as a representative of the MTMC, Figure 3 details the actors at play in engaging with the MTMC.

Having analyzed these three spaces, I will now highlight some additional connections and tensions between these websites and the codes used in this study. Applying uniform coding to the websites and the focus group interactions allows for a discussion of the two together. While comments from the focus group sessions identified some difficulties in working with these spaces in acts of digital composing, the websites offered one way the space may address those difficulties. For each code, how did the space address the concerns highlighted in that code? A space like MTMC's website leveraged a consistent vernacular in order to educate users and

prospective users in areas like *Access / Technology* and *Curriculum / Coursework*. Colorado

State University's Writing Center offered ways to help users to become more *Career Ready*.

With a broader view, MTMC's focus on the coach framed the space as a non-instructional one

and differentiated it from the classroom. By framing the space in this way, the MTMC makes it

clear that it is equipped to work alongside users toward their digital composing goals within the

institution. The Colorado State University Writing Center's focus on consultations and writings

accomplish this as well. Again, as the focus group sessions in this study highlighted a lack of

Discovery / Outreach with these spaces, it is necessary to recognize that even if a website

suggests that such a space may be equipped to help users in digital composing, other discovery

mechanisms could still be helping or hindering user's awareness of the space itself. This is a

key point of the discussion in the following section.

4.2 Discussion -- The Writing Center as a Technical Literacy Technology

At the start of this study, I expected to learn about focus group participants' difficulties in

interacting with the writing center with digital composing. That is, in-line with Pemberton (2003),

I expected to see some tension in "negotiating" hypertext physically in writing centers. Recall

that Pemberton offered four possible strategies for dealing with hypertext and technology in

writing centers:

1. "Treat Hypertexts Like Any Other Texts" (p. 16)
2. "Hypertexts Will Rarely Appear in Writing Centers" (p. 17)
3. "Use Specialist Tutors" (p. 19)
4. "Provide Specialized Training for Tutors" (p. 20)

A comment like "the writing center was not able to help me successfully use this technology"

could have pointed to a solution residing in one of these four suggestions. While comments

such as (8), (15), and (26) did discuss what takes place inside a writing center, this was not a

substantial topic of discussion in this study's focus group sessions. Further, though all three

websites analyzed in this study reference digital composing and technology in some way, it is unclear from these interactions that users could meaningfully engage with these spaces in this way. In both focus group sessions, the focus was on the prerequisites that must be met before a user may even engage with the writing center with digital composing. Within the context of this study, and from the data collected it seems that 17 years after the publication of Pemberton's article, writing studies and writing center scholars in some ways could appear to still be waiting for "hypertext" and digital composing to become relevant. This echoes a pervasive sentiment in the literature and the broader field of computers and writing: "when will technology finally be a big deal in writing studies?". What the findings of this study seem to suggest that there could be no need to "prepare for hypertext" in the writing center if the writing center does not want to engage with hypertext and does not make it clear to users and prospective users that it is capable of meeting the demands of digital composing. Even if every single consultant in the writing center possessed a complete functional, critical, and rhetorical technical literacy, without clearly broadcasting that the writing center is equipped to help users in these ways, it is unlikely that users would engage in a technical manner. This points to an opportunity to educate users about digital composing and better form the interaction toward the development of critical and rhetorical literacies. In this section, I will discuss the boundaries that define the writing center and the network that writing centers exist in, consider implications in co-composing, and discuss what this study contributes to digital composing, writing studies, and writing center studies.

The writing center has an opportunity to function as a literal "center" to formal initiatives (recall that the writing center was part of WAC at Colorado State) as well as informal ones, in the case of users electing to engage with the space. Here I discuss the boundaries between the users, the writing center, and other actors in this network. Where are these boundaries? What can be done from them? What influence can be wielded? In examining these boundaries, I will suggest some ways that the writing center could work to make digital composing more relevant to both its users and itself. To address these questions, I will focus on usability and peripheral

texts—of which websites are a part—as they help users understand what is available in an interaction, guide users toward success, and expand the scope of available interactions beyond what users may think could be possible. For both usability and peripheral texts, I focus on what Woolgar (1990) provided in *Configuring The User*.

Woolgar, in his position as Program Manager, is tasked with assembling a computer from its parts. The goal of this exercise is one of corporate team building, to be sure, but it is also an exercise for Woolgar to understand the production process involved in building the computer in order to conduct usability research on it and ultimately sell to customers. Woolgar and the usability trial program experienced a setback where "User Products felt the necessity for a physically bounded entity for use in usability testing" as "[t]he machine would not be a real machine unless it was in its case" (Woolgar, 1990, p. 76). The case is significant because it performed boundary work. The computer case separated and abstracted the machine's users from its raw circuit boards and made it appear more usable. The significance here is that while a collection of circuit boards held together by wires strewn across a desk is functional—in that users can use it to complete tasks—the computer does not appear, to end users, as though it is intended for this use. The design of the computer as circuit boards does not suggest a surface suitable for interacting with. Woolgar realized that the computer case represented the company —institution—that made the computer:

> "The surprise of finding the innards of computers regularly on display around the desks and benches in the company is part of the experience of moving from the outside to within the organization. The machine's boundary symbolises that of the company, so that access to the inner working of the machine is access to the inner workings of the company" (p. 77).

Everything contained within the case of the Stratus (the name for the computer under development) could be representative of all that the physical office building of the company contained, as well. The company's personnel, processes, and random banter, are bounded by the computer case and exist inside. This understanding of boundaries and encapsulation is often recognized in software engineering as "Conway's Law" which states that "[a]ny

organization that designed a system (broadly defined) will produce a design whose structure is a copy of the organization's communication structure" (Conway, n.p., 1967). A company or institution will design and produce bounded entities that are reminiscent of the networks that the actors, in its design, used for communication. Information flow on networks may be reinforced through the design of bounded entities.
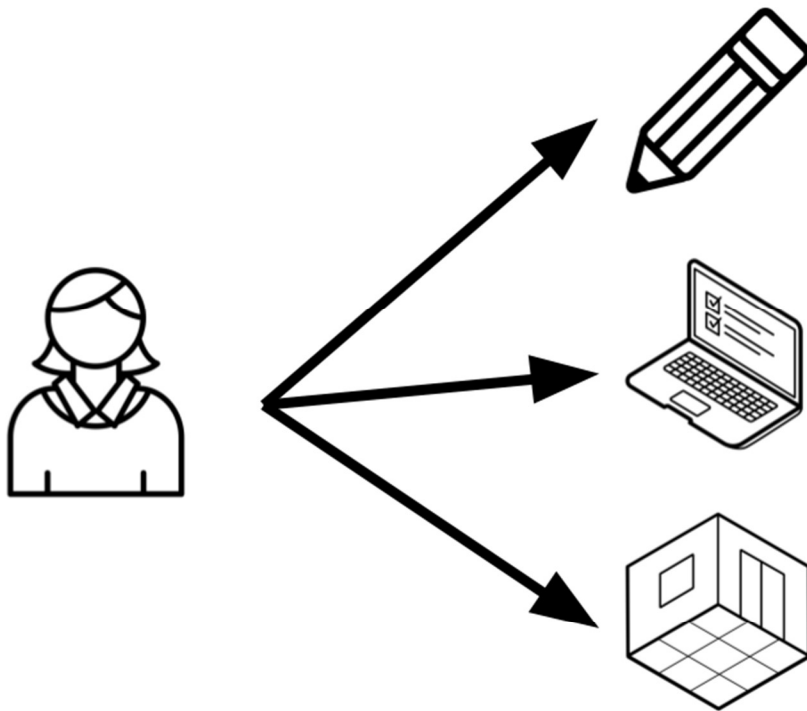
Figure 4: User Interacting with Pencil-as-Technology, Computer-as-Technology and Writing

Center-asTechnology

I suggest taking the Stratus and opening the case and ripping out all of the electronic bits (in today's digital landscape, the Stratus is ancient). These electronic bits will be replaced

with comfortable seating, movable tables, modern computers, laptop chargers, a coffee machine, windows, a front door, a front desk, displays of promotional material, warm lighting, persons familiar with the writing process and pedagogy, posters about the hierarchy of rhetorical concerns, a diversity statement, bookshelves containing books on writing practices and mentor texts and citation and style guides. With this replacement of components, it seems apt to replace the Stratus logo with "Writing Center". The writing center, when seen this way, functions in much the same way as the personal computer. It can be a tool that aids the writing process, like a pencil. The writing center, like the Stratus, might be understood as a product of the processes, communications, and persons that make it. Figure 4 shows a user interacting with different technologies—as entities, these ideas of interactions among the different technologies are identical. In this view the writing center is a technology. In Chapter 3, I recognized that this study could be viewed, in some ways, as an exercise in technical design. A core component of technical design is documentation—users must be able to understand how to successfully interact with a technology toward their goals—and often, the more powerful the tool, the more likely misusing it is. I shift the discussion to one of peripheral and documentation texts to understand how these texts could help users use the writing center to its fullest capacity.

Software design, as a form of technical design, takes the assumptions that Woolgar made about the physical case of the machine and applies it to a surface of interaction. Software is abstract. It does not physically exist inside of a box, and yet it is still a bounded collection of processes that are exposed to users through its interface which functions as a surface. Effective software design performs boundary work suggesting the design of itself as well as the design of users who are intended to interact with it. Ironically, the websites of spaces are themselves software and also may serve as a key source of documentation or as a peripheral text to the spaces and might even provide the rules for interacting with the space, as could be the case with online consultation scheduling systems. As a definition, Woolgar (1990) noted that "[w]e can think of the documentation texts as peripheral texts intended to enable the

operation/reading of a core text" (p.81) but also recognized that "the relation between readers and writers is understood as mediated by the machine and by interpretations of what the machine is, what it's for, what it can do" (p. 60). With this, it is possible to consider how websites and other forms of peripheral texts suggest possible interactions with the writing center. Flusser (2001) noted that "[t]he greater number of ways a text can be read, the more meaningful it is" (p. 37) and placed alphanumeric (rather than solely alphabetic) texts as more open to interpretation (p. 15). Websites as digital software have the potential to function as alphanumeric texts themselves that show how a writing center can engage with a prospective user and help them with their own alphanumeric texts (digital composing). To this end, a multimodal documentation text may have the potential to be more effective in educating the user about a possible digital composing engagement than a traditional text. Consider a vehicle service manual, which is certainly more effective with pictures of the vehicle with arrows illustrating the particular items of interest, than text that merely discusses which bolts must be loosened. Terse comments, such as the DMP's aim to "lead in the sustaining re-imaging of teaching, learning, and research" tell readers and prospective users nothing of what "lead"-ing actually looks like in these areas. To users who are considering engaging with this space, with digital composing, text like this does substantially aid in understanding what the space could be capable of. The idea of rich mentor texts as discussed in focus group comments (26) and (27) offer a medium where the full digital capabilities of a writing center could be displayed:

(26) "just like this big graphic thing that's just kind of fun and catchy and approachable that...says like, how do I get started on a paper or letting you know just a little of all the things that you actually do do in that space… [people look] kind of timid 'cause when you come up to a place, you're going to want to check it out by yourself first before like diving right in, and if there was some sort of you know summary of like what this place does and am I at the right place and kind of in a welcoming sort of way that they would know okay, that this is what I'm after and they know that I know that they can help me in here."

(27) "you could also do some have been anthology with business profiles like those same workshops you could have a business profile"

Peripheral texts perform boundary work and function to place prospective users into a subject position as well as educate them about how they could engage with a space. Once users do engage with the space, these boundaries disappear. I expand on this idea next in discussing implications in co-authoring and show how the idea of boundaries and the blurring of them might help inform writing center design.

Co-composition could be considered the highest form of engagement. While a prospective user of the writing center is likely to be an external actor, that user, in a consultation, becomes part of the technology of the writing center. The peripheral text helps that user to understand how to successfully interact with that space, and, equipped with that knowledge, the user and the consultant become (equal) co-authors of the user's composition. This level of interaction, guided by the user's understanding of the writing center as a technology and the consultant's understanding of writing center pedagogy, can allow for higher engagements to be attained. When the peripheral text demands more from a prospective user, the prospective user will engage more with the technology (the writing center), in the same way that Zuboff (1988) offered at the end of *In The Age of the Smart Machine*: "If you don't use your knowledge and skill, it's a waste of life. Using the technology to its full potential means using the man to his full potential" (p. 414). This also means that comments like (23) can be addressed:

> (23): "it's kind of a flattening of any kind of hierarchy of like you know oh we know everything and you come to us and we impart knowledge to you, it's it's really not like that at all I mean we make it so, like first of all, there's no dumb questions"

A peripheral text that educates the user about how to interact with the writing center can also help them to understand both their and the consultants position within the broader technology of the writing center. Notably, meta-commentary in consultations functions to achieve this same effect. Understanding the potential benefits of co-composition that result from the blurring of boundaries, I will now turn to a discussion of other boundaries that define the network that the writing center exists in, and I will discuss what blurring those boundaries toward co-composition means for the writing center as well as writing and writing center studies.

As noted throughout this discussion, while there exist opportunities for redesign within the writing center itself to support technical literacies, a full and complete redesign of the writing center to support technical literacy initiatives would also include a redesign of the network surrounding the writing center itself. While peripheral texts are one way of influencing how some actors, such as users, can act on and with the writing center and influence the network that the writing center exists in, there are other actors and other boundaries that should be considered and redesigned as well. These are other stakeholders such as the institution, curricula, external businesses and organizations, and additional ones not directly identified in this study.
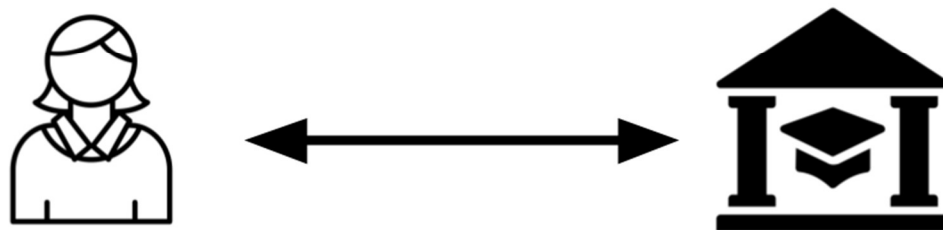
Figure 5: User Interacting with the Institution

Students, in some ways, are co-authors with the university (illustrated by Figure 5). Universities try to eliminate the boundaries between themselves as an institution and students when they discuss topics like campus communities. Students ideally co-author with the university in participating in their own education. With boundaries, in a networked perspective, the student and the university can be seen placing demands for literacy onto one another—a student demands an education and a university demands that the student learn. While at a high level, blurring these boundaries allows for an understanding of mutual goals and offers each other opportunities to work alongside to achieve these outcomes there are other implications that are important to consider. Blurring these boundaries may also work to acknowledge how overloaded composition often is in the university is. First year composition cannot do it all—teach all writing, digital or otherwise to the satisfaction of all stakeholders in the university—alone. This is simply an unrealistic ask of an already often-precarious labor situation. . The teaching labor of digital technologies should be distributed and negotiated among all actors. While the writing center may be intended to not fall under any instructional direction, there are benefits in situating itself as an equal agent and co-author with others in the network, both to help them understand the writing center in a peripheral text sense and to be better positioned to perform the sort of rhetorical work that the writing center is likely already equipped to do and to better situate it among a broader university that is doing and encouraging digital composing.
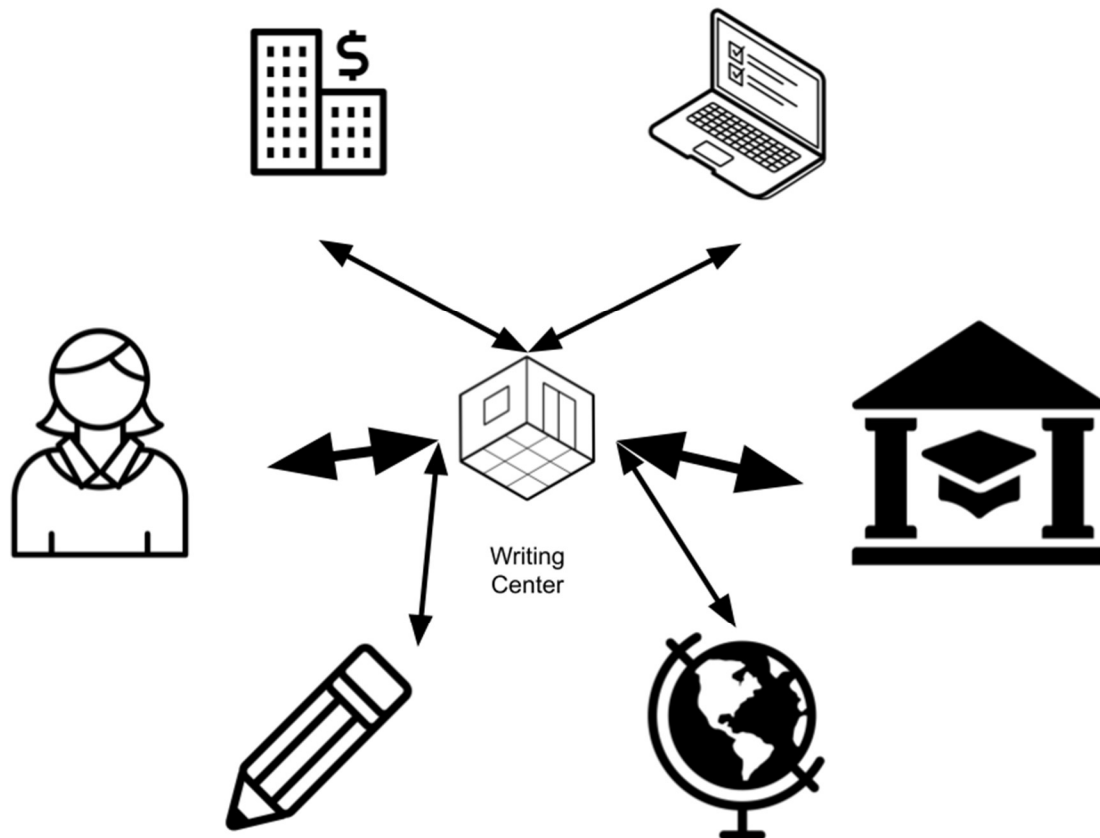
Figure 6: Writing Center Interactions

Figure 6 shows the writing center as an actor existing in a network that includes users, various

technologies, the institution, and stakeholders outside such as society and businesses. While

the primary relation exists between the user and the writing center and the writing center and

the institution (the institution provides a means for the writing center to exist), the blurring of any of these boundaries and engaging in co-authoring could yield better experiences for users according to which boundaries are blurred. For instance, a writing center collaborating with outside stakeholders might result in possibilities for greater *Career Readiness*, whereas a collaboration with other technical stakeholders and spaces on campus could result in greater *Access / Technology*. Having recognized this, I will now discuss the broader implications of working with other stakeholders and offer a discussion on what this means for writing studies and writing center studies.

Working with stakeholders outside of the writing center may be especially beneficial to a meaningful redesign of the writing center. A component of this process would necessitate recentering the writing center in this network, and in order for this to happen, there would need to be a shared understanding of what the value that the writing center both currently provides and could provide users. While it might be unlikely (and perhaps not recommended) that users will ever bring a work of programming into the writing center, the writing center still should be recognized as a place where all forms of composing—including digital composing—have the opportunity to be engaged with rhetorically. Lab reports, presentations, engineering specifications, and websites are all forms of composition that, while a writing center and its consultants may not be immediately equipped to help from a technical perspective, they can still work with the client to understand the rhetorical nature of their composing. Nearly all forms of communication have a rhetorical component that any writing center is immediately capable of engaging with and improving through questions like "how might your audience better understand what effect this is supposed to have on them?". Additionally, this rhetorical focus, when added to technology, addresses comments like (13) where "...students are so plagued and overwhelmed by [using the technology] they're not actually telling the story!" and can help to form curricula and assignments that more deeply engage technologies. This could be relevant as teaching shifts to ever-further digital modes of instruction. There are a plethora of

digital learning products on the market with a mixed understanding of how these different platforms can and should be used.

There could be an opportunity for the writing center to be a center of explicit literacy initiatives too. A "composing center" that functions to act on others and evangelize rhetorical strategies of composing is likely to be valuable. This is indeed often an aim of WAC efforts. Formally locating rhetorical composing initiatives in the writing center would give the writing center clear guidance to support such an initiative while equipping it with the resources to show prospective users what sorts of digital composition the writing center can engage with. From a purely technical view, this could lead to a revival of something like Computing Across the Curriculum (CAC) which might follow the same model as WAC. Such an initiative would educate instructors across the university to use technology in their courses in a meaningful and value-add way.

The findings of this study suggest that there may be a greater need for an interdisciplinary focus in writing studies and writing center studies. There are other fields where writing is happening and students and practitioners in these fields would likely benefit from the influence of writing studies as offered in this study. This would lead to a more encompassing and realistic understanding of what writing is and can be. The writing center, oriented differently, could help to negotiate barriers that often come in comments such as "we do the science, you are the writing people". Particularly in STEM, which is the object of a huge national focus, there could be a tremendous opportunity to engage more closely. As scholars such Fell et al. and Bussell and Taylor noted, as mentioned in Chapter 2, the field of computer science has significant overlap with the field of writing, especially when programming is seen as an act of translation and rhetorical appeal when combined with user experience design. Fields such as Software Studies and Critical Code studies function in these areas and in these there could be an opportunity for writing studies and writing center studies to engage more deeply. Further, to engage meaningfully outside of the domain of technical literacies, a deeper outreach that

educates these other fields about what is meant by a critical pedagogy (or other forms of composition pedagogy), would likely to help build interest and appreciation for the rhetorical work that writing studies is equipped to do.

4.3 Strategies for Assessing the State of Digital Composing in Writing Centers

In this section, I will briefly summarize the research methods used in this study and discuss their efficacy in analyzing the design of a writing center. I use this to provide a heuristic that may be useful in assessing how writing centers react to and work with forms of digital composing.

At the core of this study is the coding scheme that provided the codes *Access / Technology*, *Curriculum / Coursework, Training, Spaces, Career Readiness,* and *Discovery / Outreach*. I believe that all of these, with the exception of *Career Readiness*, could be valuable tools in analyzing how effective a writing center is in engaging with digital and other non-traditional composing and thus how it may engage users to grow their technical literacies. While *Career Readiness* as a code could stand on its own—a center inviting outsiders from industry to run technology workshops was one suggestion from the focus group sessions—the aim of such an activity falls under *Discovery / Outreach*. That is, if a user wants to be more prepared for a particular career, the writing center might market such a workshop on its website or in other peripheral texts to encourage that user to engage with the writing center. Broadly, the center can ask "how does this peripheral text encourage an interaction with the writing center and make it clear the modes of supported composition?".

Table 3: Writing Center Peripheral Text Evaluation Heuristic

Access / Technology	How does the center leverage peripheral texts to encourage access? How do these texts talk about technology? Are technologies encouraged? Are traditional methods of composing challenged and encouraged?
Curriculum / Coursework	Does the center's peripheral texts discuss how it might work and against traditional composing? Does it make it clear that it supports and welcomes students from classes that do have a focus on digital composing? Does it suggest itself as a space where students in a digital composing course could get assistance?
Discovery / Outreach	How does the center tell students about itself? Does it leverage digital platforms for outreach? Does it try to leverage the same technology it tries to support to further its marketing efforts?
Training	Does the space conduct its own training efforts? Is it reactive to new curricular demands? Does it make others clear of what it offers in this space?
Spaces	Does the space work to meld infrastructural space (technology, YouTube videos, online mentor texts) with affective space (consultant bios that mention notable technical skills, encouraging in-person engagement)?

Table 3 suggests questions that could be asked to guide design outcomes of the writing center

toward supporting technical literacy initiatives. These questions do suggest a certain form of

technical design. That is, these questions suggest an operational procedure (or a coded

procedure) for a user's interaction, and one that is likely to manifest in software itself either

through peripheral text of scheduling software. These questions can be directed toward the

consultants in the writing center as well who are themselves designers and actors of the writing

center space and are one important actor responsible for driving change in the writing center.

As the writing center grows in technical literacy scope, those with more technical literacies or

interest in them might become more encouraged to work with the center and to become a part

of it, and can then continue to help drive the redesign of a writing center to support technical

literacy initiatives, which ultimately leads to more users and students engaging with technology

and developing a greater technical literacy themselves. This, combined with traditional writing

pedagogies with a rhetorical focus, will lead to a better critical understanding of the intricacies of

technology among those that engage with the writing center.

5: Implications for Practice, Research, Tutoring, and Design

In the final chapter of this study, I will summarize and offer implications for writing studies and writing center studies in the areas of practice, research, tutoring, and design. In the first section, I will provide a speculative vision of what a writing center that is fully equipped to to participate in and foster technical literacy initiatives could look like in the areas of practice and tutoring. In the second section, I will discuss difficulties and considerations for the research that arose from this study, which should be considered in future studies. Lastly, I will suggest opportunities for future work that would likely be complementary to this study, and to the field of writing studies and writing center studies.

5.1: A More Ideal Writing Center

At a glance, a writing center equipped to support technical literacy initiatives looks remarkably similar to an existing writing center. Focusing on the infrastructural attributes of the space, there is still flexible seating with tables and couches for collaboration, secluded spaces for one-on-one consultations, shelves with various resources, digital technologies like projectors and computers, and maybe it even has windows and a view. Bridging the infrastructural space with the affective, there is still someone to greet users and welcome them into the space and there is still a method for scheduling a consultation online or through the appointment. There are more displays of the types of composing that this writing center is equipped to deal with, which help to make users comfortable and aware of different forms of digital composing. From this, the bookshelves may cover a wider range of content, and there are likely some resources that discuss the interdisciplinary nature of the work of composing as well as examples of multimodal composing and technology in the form of mentor texts.

I propose that these mentor texts and digital composing examples are chosen by the consultants in the writing center during their orientation, out of their own experiences as students engaging with different forms of composing. This means that the examples are relevant to the consultants as well as the users engaging with the center, and noting which consultants selected or created a particular mentor text can help guide users to a particular consultant who may have more experience with a specific type of composing than others (this is, in effect, Pemberton's third suggestion of having specialized tutors and making those specialties known). These materials are available online, both to increase access, but also by necessity, as some of these texts are digital-only. Between these materials and what new users bring into the center, gaps and new technologies that need examples can be identified and consultant training can be updated to cover these new methods of composing. Alongside all of these materials can be a "discovery board" that functions to demystify the process of digital composing and show how others have engaged in process writing with other forms of composing. This would offer a dialogue of explanation as to how or why a particular technology might have been chosen for a particular task and a discussion of the challenges encountered when trying to use it effectively. Tracking how digital composing projects got started (from humble beginnings, like the rest of writing) can help to instill a sense of humility in the writing center as new users seek to understand what an interaction with the writing center might offer them with their digital composing work. Born from interactions with these mentor texts and with the consultants are FAQs (frequently asked questions), available online and physically in the center. Here, YouTube videos vetted by consultants or created in-house can function as repeatable documentation toward niche objectives like formatting, and can help the center to be a more broadly seen actor that can aid in coursework and help students and instructors to meet curricular demands with technology and digital composing. All of these together—mentor texts and examples of digital composing, FAQs, and discussions on the process of composing—

serve as peripheral texts to help users understand how they can engage with the writing center as well as what an engagement may offer them.

This writing center would follow the guidance of Balester et al. (2012) in being responsive to new demands, new technologies, and newly identified difficulties its users have in working with technology by offering its own workshops. These could range all the way from educating users about the university learning management system (like Canvas) to providing training on functional computer literacies, like file naming and folder organization (a pain point mentioned by Selber). With these workshops established, the center might opt to invite others, from outside the center, in, to conduct workshops as well. This could include other spaces on campus such as the library or other labs, but also persons from the other fields in the university or outside the university. These workshops and sessions would be recorded and posted online for greater access and while they wouldn't directly function as a peripheral text that would tell users how to engage with the writing center, they would nonetheless serve as marketing and show the sorts of engagement that the writing center could be a part of.

With all of these efforts, the writing center could begin to take on a broader role itself as a center of technical literacy initiatives. Through more compelling and better uses of technology and digital composing for outreach, the writing center can talk about the rhetorical advantages of writing studies, and can be seen as something other than a fix-it center -- especially by fields that have traditionally viewed it as one. At the core, it is still a writing center with consultants and the writing center pedagogy, but it understands and evangelizes the process of writing and the rhetorical ideas of writing both across the curriculum as well as in technology. This writing center could become a center not just for WAC-like initiatives for writing, but for computing and digital composing as well, offering workshops to help faculty understand how to use digital composing platforms in meaningful ways in their curricula, which then would help students to develop stronger technical literacies themselves.

5.2: Difficulties and Considerations

The first difficulty in this study came in student recruitment. At the time this research was taking place, COVID-19 led to the shutdown of many physical campuses, including Colorado State University, which made the already-difficult task of recruiting students for focus group sessions impossible. As such, the focus of this study shifted toward faculty, instructors, and administrators. While there is no doubt that broader participation in the focus groups, and with more perspectives, would yield more data, it is not known whether it would have provided either more meaningful, or different data. If there were student participation, from the findings of this study, I would expect that two subgroups would emerge: students that have used the writing center, have achieved positive results, and expect to continue to engage with the writing center, and those that have never heard of the writing center and are unsure if or how it would help them. This study addresses the concerns of the latter of these anticipated groups through the incorporation and analysis of websites as peripheral texts.

Another difficulty in this study stems from the limited available context of analysis of how these spaces function and how users are directed toward them. This study focused on publicly available websites as peripheral texts where there could be different websites for these spaces located elsewhere (like in an LMS) that might offer a different or more comprehensive reading of this space. Further, other marketing materials like flyers around campuses or presentations given in classrooms to students all function as peripheral texts as well, and this study does not take those into account. Similarly, this study does not consider how these centers are talked about on campus. Perhaps all instructors are formally given guidance on how or why to refer their students to a writing center or other space thereby placing student discovery on instructors who believe their students may benefit through interacting with the writing center. At smaller

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institutions, word of mouth advertising for writing centers may be enough. This is to say, however, that it is very difficult to account for all different peripheral texts that may accompany a different space. A space may not even be aware of all texts that it produced and their corresponding rhetorical velocity (Ridolfo & DeVoss, 2009). Analyzing other peripheral texts will likely produce different perspectives on writing centers and related spaces and is an opportunity for additional research.

5.3: Opportunities for Future Work

From this study, there are some notable opportunities for future research in writing studies, writing center studies, as well as in HCI and UX research. As noted in the previous section, while I am not certain that additional student perspective would have dramatically altered this study, that is the most immediate area for additional research. Students could be surveyed or interviewed about their experiences and difficulties in using technology and digital composing to identify more specific areas of tension. Alongside this, syllabi and curricula could be evaluated to see how they reference specific technologies and evaluate their successful application in ways similar to what Davis (2014) researched.

More research around the outreach and marketing efforts of writing centers could be studied and data collection (as well as assignment type, as McKinney and McKinney (2016) did) in the form of post-consultation surveys could prove fruitful.

While it requires a critical mass of users bringing digital composing into the writing center, observation and analysis of these technology interactions could prove useful for HCI and UX design. Buck (2008) performed user observations on writing center consultations as mediated through Microsoft Word, but this is far from the only technology that is used in the writing center.

In the same way, usability studies of LMS systems toward the goals of writing studies could prove useful.

   Lastly, I believe continued research into the intersection between computer science and software programming and writing studies may be fruitful, especially with the growing national focus on STEM education. As mentioned earlier, some of this research is encompassed in fields like Critical Code Studies and Software Studies but could certainly be supplemented by writing center studies as well, especially in the topic of pair programming.

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Appendix A: Recruitment Emails for Faculty and Students

Hello!

I'm a masters student in the Writing, Rhetoric, and Social Change program in the English Department at Colorado State University and under Assistant Professor, Dr. Timothy R. Amidon, English department, I'm conducting a research study("Re/designing writing centers to support digital literacy initiatives", IRB: 19-9630H) to examine attitudes and ideas that instructors and students have about centers, labs, and other non-instructional spaces with respect to developing and practicing digital literacies. Examples of the kinds of literacies we are interested in learning more about include composing blog posts, designing websites, using Photoshop and similar tools, multimedia presentations, and other activities that you would consider as composing-with-a-computer.

[Students]
I would like you to participate in a focus group comprised of no more than ten participants. Participation involves being part of two, one hour focus groups. Each of the focus groups you participate in will be conducted on the main campus at Colorado State University.

The first session will be held on March 10, 2020 and the second session will be held March 12, 2020, from 5-6pm. Pizza will be provided.

[Faculty]
I would like you to participate in a focus group comprised of no more than six participants. Participation involves being part of two, one hour focus groups. Each of the focus groups you participate in will be conducted on the main campus at Colorado State University.

The first session will be held on March 10, 2020 and the second session will be held March 12, 2020, from 1-2pm.

Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty.

We will record the focus group sessions with audio only, and all identifiers will be removed when the session dialogue is transcribed. Participation in a focus group involves some loss of privacy and while we will make every effort to ensure that information about you remains confidential, but cannot guarantee total confidentiality. Your identity will not be revealed in any publications, presentations, or reports resulting from this research study. While we will ask all group members to keep the information they hear in this group confidential, we cannot guarantee that everyone will do so.

While there are no direct benefits to you, we hope to gain more knowledge on how these spaces can be better designed to support digital literacy learning that students and instructors at CSU hope to promote.

If you are interested in participating, please reply to Matt Getty (matt.getty@colostate.edu).

If you have any other questions about the research, please contact Dr. Tim Amidon at amidont@gmail.com or Matt Getty at matt.getty@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at RICRO_IRB@mail.colostate.edu; 970.491.1553.

Tim Amidon Ph.D., Assistant Professor
Matt Getty

Appendix B: Focus Group 1 Script

Introduction / Consent [10-15 minutes]

Hi, welcome. I'm Matt Getty, one of the researchers for this study. Thank you for participating. You're here because you have some experience and affinity with technology, spaces around campus like the Writing Center, and classes and assignments that have asked you to compose or engage with technology. That is, we're seeking to examine the attitudes and ideas that both instructors and students at Colorado State University have about non-instructional spaces -- the writing center, labs around campus, the library -- and how they work with technology. Examples of such practices include composing blog posts, designing websites, using Photoshop and similar tools, multimedia presentations, programming -- writing software and applications, and other activities that you would consider, in some way, as composing-with-a-computer.

Please review the consent form -- this was emailed to you ahead of time, but I'd like to review some points with you as you consider your participation. Your participation is voluntary. You can withdraw at any time with no implications. We will be recording this session, audio only. We will remove all identifiers in transcription, and as such, no reference will be made in written or oral materials that could link you to this study. However, participation in a group like this involves some loss of privacy. We will make every effort to ensure that information about you remains confidential, but cannot guarantee total confidentiality. We ask all of you, as participants, to keep the information they hear here confidential, but we cannot guarantee that everyone will do so. If you would like to participate, you'll need to sign the form and turn it in. If you would like to leave, you're welcome to do so.

So, to get started, I'd like folks to briefly introduce themselves and say a little bit about their relationship and experiences using computers at CSU in classes to write or design. For example, [some of you may have had opportunities to design webpages or have blogged; perhaps you've had a class where you edited photos or performed sound design work.]

The Exercise: I Like, I Wish, What If

Our goal for this first focus group is to imagine what a re-design of the writing center and related spaces would look like to support these digital and technical interactions.

With regards to these experiences, we're going to dive into the main exercise for this session. We're going to talk about things that you like or have liked about these experiences, things that you wish could happen or exist, and then what-ifs -- the more possibility-stretching ideas about what these sorts of spaces could look like and how they could function.

Going through all members of the group, I will write down some of the key points of their "Like, Wish, and What-If" on a whiteboard, so that we can later evaluate them.

Review

Great -- of these (on the board), are there any that we want to talk about more in-depth? What is something that seems particularly important to the experience of students in these spaces? What is worth exploring in the future? What do you think would enhance the student experience the most?

End

Thank you all for your participation! Remember, there will be a second session as well.

Appendix C: Focus Group 2 Script

Introduction / Consent [5 minutes]
Hello, welcome back! Thank you for participating in the second out of two focus groups.

First, I need to remind you that your participation is voluntary. You can withdraw at any time with no implications. We will be recording this session, audio only. We will remove all identifiers in transcription, and as such, no reference will be made in written or oral materials that could link you to this study. However, participation in a group like this involves some loss of privacy. We will make every effort to ensure that information about you remains confidential, but cannot guarantee total confidentiality. We ask all of you, as participants, to keep the information they hear here confidential, but we cannot guarantee that everyone will do so.

Great, now our task last time was to focus on what a re-design of a writing center or similar space would look like, in order to better support digital and technical assignments and interactions, such as working with photoshop, making a podcast, building a website, writing blog posts, or even programming and writing an application.

Today, our task is to evaluate some some other's vision of a space, and think critically about what works in it, and what doesn't work in it, and decide if it would meet the needs of yourself.

Review Exercise [5-10 minutes]

Let's look at some of the key points that [other user group has articulated about] a space like this and first talk about them a little bit. Then we'll go through a more cognitive walkthrough and try to envision how a space like this would actually function if a student came into it needing help in some way.

Review, briefly, the other participants' previous session's suggestions from the "I Like, I Wish, What If" exercise.

Cognitive Walkthrough [Remaining time]

Leveraging a persona(s) / situation(s) that came up in the first sessions, as a group we will, walk through that situation through the Cognitive Walkthrough framework to see how it might function.

Introduction to the Persona / Situation

Let's first consider affordances in this space. Affordances here are things that a person can do or accomplish -- things that can be done with the tools available. What seems possible in this space? What could people do in this space that is unique?

How would the student discover the affordances available to them in this space that are relevant to them?

How would the student determine if they can be successful in this space?

How would the student interact in this environment to meet their outcomes?

How would the student know if they were learning and moving toward their goals in their interaction in and with this space?

End [Last 5 minutes]
Thank you all for your participation!!

Appendix D: Focus Group 1 Coding Table

#	Comment	Coded As / Explanation
1	"Google docs, it enhances...creates that much more of an authentic audience"	*Access / Technology* & *Curriculum / Coursework* It involves both a student accessing technology for a class, as well as interacting with technology itself, all within a classroom setting, or for a class.
2	"Some students have never seen Google or don't even how know to access it"	*Access / Technology* & *Training* stuck out as an assumption of both access to technology (and the norms that come with using a particular platform), as well as training. Some students, especially international students, have never used Google products and are thus at a disadvantage -- yet there is no sort of broad training for them to gain these sorts of skills.
3	"It's really hard as a teacher to teach not only your content but also have to teach somebody how to use something that might be assumed as known"	*Training* & *Access / Technology* The theme of this comment occurred relatively frequently. With curricular demands, there is only so much that can be done inside of a classroom, and as such, you have to work with some basic level of assumptions -- in this case, assumptions of technical literacy. The cost of this is that there might be those who don't have experience (or access) to a particular technology, and then the course and the assignment will arguably fail them.
4	"Some foundational training...we make this assumption that all students...are digital natives…"	*Training* & *Access / Technology* As a result of training, as in comment (3), power dynamics are created, and often atypical ones where it is assumed that students know more than the instructor, and hence require no instruction. The broader context of this particular comment, however, is that not all students are digital natives (that is, they don't have access), and that treating them as such, with the assumed power dynamics, makes technical assignments ineffective.
5	"What can I do to fulfill the things that it's	*Training*

	being assumed that I know?"	This comment follows (3) and (4), in the desire for more training so that instructors can actually know the technologies that it's otherwise assumed that they know.
6	"Training drop-in sessions for technologies"	*Training* & *Access / Technology* This comment simply asks, what if there were drop-in training sessions that anyone could attend -- student or instructor -- that covered particular technologies, like Canvas or Google Docs.
7	We could be responsive to students coming into the center with questions	*Access / Technology* & *Training* & *Spaces* This is coded as such because, first, it's a question of access, if students are able to come into a space or use a space to be able to get the answers to the questions that they need (or want), and second, because, on the other side of this conversation, someone needs to be able to answer that question, and there's a fear that they may not be trained in order to respond to those types of questions.
8	What if There was a collaboration between the writing center and other spaces on campus?	*Spaces* & *Access / Technology* How a given space works is usually limited to that space itself. Increasing space collaboration changes both the space but also access to the space and the affordances of both spaces.
9	"I wish there was a deeper level of commitment to the platform...a lot of times, it seems like a blog post would be cool, let's do it, but there's not a lot of correlation to what that blog post is really doing and functioning as a literacy"	*Curriculum / Coursework* This comment reflects on the notion that often using technology in a class setting encompasses one sort of 'token' assignment. This single assignment doesn't really require that the students (or instructor) really interact with the technology in a meaningful or rhetorical way, and reduces the technology's use to a box-to-tick.
10	"As an instructor [if] I'm struggling...I don't want to let my students know that I'm struggling"	*Access / Technology* & *Training* *This is coded as, again, there is a presumed level of access and literacy to a technology that an instructor is assumed to have, and training would be necessary in order to help instructors display the level of access and literacy toward a technology that students may otherwise assume they have.*
11	"I think the nature of these technologies	*Training* & *Access / Technology*

these days is that the instructors don't know all the stuff, none of us do"

This comment follows after (11), in realizing that there should generally be a broad level-set wherein no one knows the entirety of technology and how to use it. Technology use, from this comment, needs to be a collaborative activity in order for it to be successful and in order for learning to take place. As a follow-up to this comment, the word "humility" came up, to fill this question of interaction and knowledge.

12 "...why did we choose this genre of technology to pair with this task that we're doing in the classroom?"

Access / Technology & Curriculum / Coursework
This comment talks about how, often, it seems that technology is chosen arbitrarily. That is, a lack of understanding of why a particular technology may or may not be suited to accomplishing a particular composing task.

13 "...students are so plagued and overwhelmed by [using the technology] they're not actually telling the story!"

Access / Technology
This is coded as such because this comment details the perils of composing with technology, especially with a relatively 'low' level of access -- the technology becomes the main goal over the composing goal.

14 Engaged internship programs

Training
This comment focuses on the benefit of having students work in these sorts of center. It makes the centers more approachable to other students while also providing them with the experience of serving in a tutorial role. This then is training both for the student working in the center, as well as the training that that student can offer to others.

15 "I wish our writing center had windows in it...think about locking yourself in a closet and trying to write!"

Spaces
This comment is important -- the physical space of a writing center is so important, it's realized everywhere.

16 "students should be exposed to these kinds of platforms will really help them in the future"

Training & Curriculum / Course Work
This comment questions the end-goal of some of the technologies that get assigned in course work. In the same way that they are often just for 'technology's sake', this makes the note that it would be good if there was more 'real world' context to the technology use.

Appendix E: Focus Group 2 Coding Table

#	Comment	Coded As / Explanation
17	"...often times people will come in and be like 'we had no idea you existed, but now that I know you're here, I'll be here all the time'"	*Discovery / Outreach* This comment talks about the surprise that users often have finding out about these spaces and what they can offer them.
18	"[Microsoft] Teams is one of these communication platforms that's being used in the real world out there"	*Career Readiness* This comment talks about technologies as "out there", meaning, not necessarily in the university or mentioned in the curriculum, but as something that students will likely encounter in their career.
19	"a big thing especially now we're learning in schools, especially like project-based learning schools like even your spaces, I think like outside Community is so important for that"	*Career Readiness & Spaces & Curriculum / Coursework* This comment is discussing the value of community (outside communities) and project-based learning and the shared learning objectives that they might have, and as such it's coded as such because project-based learning would be most successful if it cut across both space and class work in order to lead to career readiness.
20	"the business world is always criticizing the universities for not producing students who meet their demands, so it is some kind of collaboration between the business world and in the schools then that gap would be breached"	This comment highlights the tension between career readiness and the seeming-feeling of business not believing graduates are 'career ready'. A possible manifestation of this outside workshops that take place in these spaces.
21	"I think it's great to remember that their role there is not necessarily to teach them all about the business, it's how are we writing in this business? Like what are our modes of communication that need to function?"	*Curriculum / Coursework* This comment fights back against any idea of solely teaching for employment, and suggests that writing could be the focus; the real genre of how writing and communication gets written in this particular business setting might be more valuable than other traditionally assigned writing genres.
22	"flexible seating's a huge thing even in the writing center and in a classroom 'cause like people think and learn	*Spaces* Seating and physical space is something that goes noticed by those that enter it -- the

differently, and that supports like their comfort level which ultimately reduces the amount of like anxiety they might have coming in there"

comfort of a space and what it appears to be and what it appears not to be (the writing center definitely doesn't look like a classroom!) helps to encourage interacting with the space.

23   "it's kind of a flattening of any kind of hierarchy of like you know oh we know everything and you come to us and we impart knowledge to you, it's it's really not like that at all I mean we make it so, like first of all, there's no dumb questions"

Access / Technology & Spaces
Continuing on (22) about how a physical space can encourage comfort, there needs to be a clear flattening of knowledge hierarchy too -- breaking down expectations that any one party might know more about a particular technology -- in order to work together to accomplish goals.

24   "So I think have multiple people in the room is really kind of helpful and knowing that it's okay to eavesdrop and knowing that it's okay to to participate in whatever it is because you never know where that little insight is going to come from, or where that little empathy is going to come from"

Spaces
As is often insisted in writing centers, eavesdropping is can allow others to chime into a conversation and help when it might be appropriate. This is a physical attribute of a space -- having many different consultants or tutors in it, and hopefully together they might be able to overcome new challenges.

25   "we were timid about doing about doing any kind of really broad outreach just because of what we can and can't handle"

Discovery / Outreach
Being too good at outreach can be a challenge too, however, because then that can lead to the resources (personnel) of the space being overwhelmed. They need to go hand-in-hand.

26   "just like this big graphic thing that's just kind of fun and catchy and approachable that...says like, how do I get started on a paper or letting you know just a little of all the things that you actually do do in that space… [people look] kind of timid 'cause when you come up to a place, you're going to want to check it out by yourself first before like diving right in, and if there was some sort of you know summary of like what this place does and am I at the right place and kind of in a welcoming sort of way that they would know okay, that this is what I'm after and they know that I know that they can help me in here."

Discovery / Outreach & Spaces
This is a notable suggestion toward achieving better discovery and outreach in a space -- it's about marketing, outward, the affordances of a space. With respect to a writing center, this could and should include examples of digital composing too, so that it's a known quantity that this space can help with.

27   "you could also do some have been anthology with business profiles like those same workshops you could have a business profile"

Discovery / Outreach & Access / Technology
In the same manner that this space could have different samples and better suggestions for what this space could offer, there could also be

		some profiles (or marketing) of how writing and communications might get done in these businesses, to try to show how composing is important in other areas.
28	"[the] most important things for student recall are for them to actually know that they're doing the thing"	*Technology / Access & Curriculum / Course Work* This is an important realization especially with respect to composing with and interacting with technology. The space has to be equipped so that the student can not only access the knowledge, but access the process to be successful, and understand that they are doing the right thing -- especially in digital composing.
29	"I don't know because some students, when they see something too big...they may be intimidated to approach it"	*Technology / Access* In talking about showing sample work in a sort of anthology, this comment came up. Digital forms of composing don't need any more disincentive to do, and so it's a fine line to walk between showing something that's approachable and interesting versus showing something that might be intimidating and drive the person away from composing in this new manner.
30	"way back to you where they don't even know how to save a file, even just like having a space like in a writing center, like I don't know how to save a file, let me go to this really like, low-risk, low anxiety space...don't make them feel dumb!"	*Technology / Access & Spaces* This comment is especially interesting because it directly mirrors a complaint made by Selber (2004) about computer science courses teaching students how to program, but not teaching them how to perform more-basic tasks like file naming or folder hierarchies. These sorts of educational goals could and should be addressable in these spaces.
31	"I think we need to trend in the writing center, in that way, whereby students don't have to necessarily go to YouTube to download some videos to watch how to maybe write a text or how to write a particular genre because the Writing Center will have the most credibility compared to YouTube so if we can send empower, writing centers, digitally, to control that space"	*Technology / Access & Spaces* The space of a center shouldn't end at the walls that encompass it. This comment blends access to certain sorts of knowledge to something outside of the space, by suggesting that there might be places where educational resources could be made (or at least referenced) to other things like YouTube videos or other instructional media. A good example here could be formatting questions.

32	"students especially on campus are so overwhelmed, I mean, think about how many flyers you see everywhere, so, that's a really tricky thing. How do we, how do we set yourself apart from that? So I wonder, even if almost making, like, does the writing center have a facebook page?"	*Discovery / Outreach* This comment recognizes that students are overwhelmed and that it's important to try to meet them where they are, if they are to become a user of this space in some way, shape, or form.
33	"I think, if there's a link to, a link on canvas to the writing center, where students can just click and just go straight to the writing center...There should be a link...And then there may be some kind of snippets of videos showing the way that writing centers, consultations are done, not necessarily talking, but 1:1 that the consultant and the student will have in different positions...let some of them understand that ok, the writing center is not just another classroom where you go, it's a place where you go and meet somebody 1:1 and you feel relaxed, yeah"	*Discovery / Outreach* This, I think, is one of the most potentially impactful comments and suggestions that falls under outreach efforts. As I suggest later on, access -- linking to -- a space's website in order to figure out if it's a good fit is important, and this comment suggests that we put access to the writing center in a space where we know students will be interacting -- the LMS (Canvas).

Appendix F: Ohio State Digital Media Project Reading

Implied Subject Position / Relations	Code / How To Read It
"Teachers, Students, Scholars"	*Spaces / Access & Technology* This comment, seen on the main page, calls out different subject positions that can interact with this space. This makes it appear as though it is for all of these different groups to interact with -- they can continue reading.
"Faculty, Staff, Graduate Students" and "Undergraduate Students"	*Spaces / Access & Technology* Under "Resources", there are mentions of these subjects and the various abilities to have access to the resources in this space -- equipment for loan. Any of these groups can come into the space and interact with the technology, though there is no explicit mention of what can be checked out.
"Instructors"	*Spaces* Under "Facilities", instructors can leverage any of these spaces for their classes. Spaces are listed solely with the pure resources that they offer "24 iMacs", seeming as if it is up to the instructor to make sure the technology is well-suited to a particular task.
"Instructors"	*Training / Curriculum & Coursework* Under "Teaching", the site notes that the DMP provides things from "in-class workshops on software and hardware, to assistance in developing digital media assignments and assessment...even with issues as simple as projecting media in the classroom for your students". Instructors may read this as the opportunity to work with the DMP for training, both for themselves, but also to support their students in their composing endeavours.
"Instructors and Students"	*Access / Technology* There is a "Community" page, though it is very sparse, simply mentioning that the "DMP supports the Department of English...assisting instructors and students with using technology in the classroom and for research"

Appendix G: Colorado State University Writing Center Reading

Implied Subject Position / Relations	Code / How To Read It
"Graduate students and upper-division undergraduate students"	*Career Readiness* The homepage notes "We're Hiring", as a signal to students for *Career Readiness*, at least with respect to those interested in writing as a profession.
All Users	*Access / Technology* The homepage invites me, as a user, to "Make an Appointment". This is a very clear action that I'm supposed to take -- it is the largest link on the page. Similarly, the center notes that there are different services offered to students for making an appointment: "We offer the following services online…" (this site was evaluated during a campus shutdown caused by COVID-19).
Instructors	*Curriculum / Coursework & Discovery / Outreach* Similar to the "Make an Appointment" link, there is "Schedule a classroom presentation", which offers those with a classroom (instructors), the ability for the writing center to interact with that classroom.
"Writers"	*Access / Technology & Spaces* Under the "About" header, there are clear instructions of how to interact with the writing center as a writer, and what success will look like if I successfully engage: "...writers walk away with the confidence to make effective writing choices in any writing situation". This leads to a clear answer whether, I, as a user and a writer, will achieve my goals in interacting with this space.
"students, faculty, and staff of CSU and with members of the local community"	*Discovery / Outreach & Spaces & Access / Technology* The "Services" page offers something for each of these subject positions, which are numerous. They note that in "Face to Face Consultations…[which] last for 30 minutes...we...discuss the equivalent of 4-5 pages", and the process that will be taken. Classroom presentations are also offered here, nothing that "The Writing Center invites all instructors to set up a promotional visit for their classes".
Students and Teachers	*Access / Technology* The "Resources" page provides outside (writing center) resources for "students" and "teachers", to further their writing. These resources are different pages that might be accessible in different ways.
Space Users	*Spaces / Discovery & Outreach*

	The "Staff" page has details about the staff that you can expect to interact with while interacting with the writing center, which serves to demystify the space and put a face to the center.

Appendix H: Michigan Technical University Multiliteracy Center Reading

Implied Subject Position / Relations	Code / How To Read It
All Users / Coaches	*Spaces & Access / Technology & Discovery* Immediately upon interacting with the site, we notice a clear offering of what the space is good for. It additionally suggests that you will be working with a coach: "MTMC coaches can help with anything in the realm of multiliteracies, including visual, aural, written, and spoken text forms…"
All Users / Coaches	*Curriculum / Coursework* The space notes how it can be helpful in common places with respect to different coursework: "upcoming papers, exams, or assignments"
All users / Coaches	*Access / Technology & Curriculum / Coursework* Of note, the space explicitly calls out discussion posts as a medium that you can bring into the space to receive assistance on.
All users / Coaches	*Spaces & Discovery / Outreach* There is very clear guidance on what to expect with a page titled just that: "What to Expect in an MTMC Session" that outlines the full interaction from scheduling an appointment, engaging with the space and the coach, and leaving the appointment.
All users / Space	*Spaces & Career Readiness* The site offers resources -- mentor texts -- that cover a full gamut from technical communications and resumes, lab reports, and basic formatting and citation guidelines.